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DRAFT FOURTH PLAN

MATERIAL AND FINANCIAL BALANCES

1964-65, 1970-71 & 1975-76

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PERSPECTIVE PLANNING DIVISION
PLANNING COMMISSION : GOVERNMENT OF INDIA

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DRAFT FOURTH PLAN

BALANCE AND CONSISTENCY

Introduction

1. The Draft Outline of the Fourth Five Year Plan presented to the Parliament describes the general considerations shaping the approach to the Fourth Plan, the main features of the proposed programme and the major policy issues involved in the pursuit of specified objectives. Being intended for the public at large, the Draft Outline dealt with these matters in non-technical terms. The rationale of the programme was explained in rather broad terms. The basis for arriving at particular targets was not spelled out. Nor was an attempt made to show in detail the internal consistency and balance of the Plan in its different aspects. The present series of notes and tables is an attempt to bring out, more explicitly and fully than was possible in the Draft Outline, the underlying logic of the Plan and, in particular, the calculations which have gone into building up an internally consistent picture of physical targets, investments, savings and balance of payments.

2. The elaboration of a detailed and internally consistent programme corresponding to a given set of overall objectives regarding income, investment, savings and foreign trade and payments, involves first the preparation of a balance of aggregate income and expenditures and their disposition between different categories of final demand. The commodity composition of each category of final demand has then to be estimated. This together with the structure of input requirements for different sectors provides the basis for estimating the internally consistent total requirements of final and intermediate goods. At this stage, it is essential to take into account the overall constraints on imports and the directions and degree of import substitution which is technically possible and economically justified. The required increase in domestic output and capacity for various branches provides the basis for estimating investment needs. The total investment needs so derived must be consistent with the aggregate investment implied in the macro—economic projections. The total investment in its turn must balance with the projected savings and foreign aid. Moreover, a viable plan must not only be consistent and balanced, but operationally feasible.

3. When planning has been in force for a number of years, it is not easy to identify a simple logical sequence of steps for evolving an internally consistent plan for a five year period ahead. The actual process of plan formulation is much more involved and is a constant interplay of thinking at aggregative level as well as in regard to specific details of concrete projects. Thus, the work on India's Fourth Plan started nearly four years back with the appointment of a number of Working Groups to formulate proposals for development of individual sectors. Based on the work of these Groups and in the light of

a number of studies made in the Perspective Planning Division, a comprehensive paper[1] was prepared by the Division in April 1964. It presented a reasoned analysis of the perspective of development upto 1975-76 and set out the implications in terms of income growth, pattern of production, investment and foreign trade. It also discussed the issues connected with ensuring minimum level of living and achieving self-reliant growth at a satisfactory pace by the end of the Fifth Plan. However, as new facts and circumstances emerged and the proposed programmes were examined further, it was considered necessary to lower the targets of income growth. The subsequent stages of consideration are reflected in the Planning Commission's *Memorandum on the Fourth Five Year Plan*, (October 1964) and *Resources, Outlays and Programmes*, (Sept. 1965) and finally the *Draft Outline* (August 1966). The final Draft Outline incorporates the objectives and strategy which, on a balance of considerations, is deemed to be necessary and feasible. Though for reasons mentioned earlier, the Draft Outline itself does not elaborate on the balance and consistency of the Plan, the detailed work in the Divisions of the Planning Commission and Ministries provides the basis for establishing that the Plan is internally consistent in all essential aspects. This series of papers marshals relevant material in evidence of the balance and consistency of the Plan, supplementing the results of other studies by analyses made in the Perspective Planning Division.

4. The notes and tables are divided into six sections:

Section One : Estimates of National Income by Sectors of Origin

Presents the details of national income for different sectors in 1960-61, 1964-65, 1965-66 and 1970-71. The estimates for the first three years are based on actual output and those relating to 1970-71 are based on physical targets of production indicated or implicit in the Draft Outline of the Fourth Plan. In a separate Appendix an analysis has been made of agricultural production trends during the first three plan periods. Estimates of production levels at the end of the Fourth Plan arrived on the basis of past trends have been compared with the targets in the Fourth Plan for selected major crops.

Section Two : Material Balances

Contains balances of demand and supply for principal agricultural commodities, 31 selected major items of manufactures and minerals, including electricity. The balances show the estimated demand in 1965-66 and 1970-71 by categories of end use, the estimated imports and domestic production.

Section Three : Development of Transport

Besides a discussion of demand and supply balance for different modes of transport, includes information on investment programmes and direction of technological change.

Section Four : Financial Balances

Includes, in one series of tables, Macro-economic Balances for 1965-66 and 1970-71 showing total resources and their use, capital account of the economy, Government's current account, and personal income and its disposition. Another series of tables shows in detail the financing of the Plans in the Public and the Private Sectors.

Section Five : Balance of Payments

Deals with the balance of the economy on its external account. Estimates of exports, import requirements, the balance on invisibles account and the overall balance of payments deficit for 1964-65 and the Fourth Plan are given in detail. Provisional estimates for 1975-76 have also been included.

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[1] Planning Commission, Perspective Planning Division, *Notes on Perspective of Development, India : 1960-61 to 1975-76* (April 1964).

Section Six : Structure of Indian Economy : 1964-65, 1970-71 and 1975-76

Describes an Input-Output Table showing inter-industrial flows and pattern of final demand based on a 77 sector classification The overall income, investment, savings, exports and imports for 1970-71 are in line with the formulation of the Draft Outline. Estimates for 1975-76 are based on two alternative targets of income, investment and foreign trade : one corresponding to the upper limit of the long-term projections of the Third Plan and the second to a lower (by 5 to 6 per cent) level of income and investment but bolder in its assumptions regarding exports. An interesting feature of this Input-Output Table and the associated Chart (enclosed) is that it is a composite of four separate tables corresponding to 1964-65 (base year), 1970-71 and 1975-76 (in two alternatives) The device of showing the elements corresponding to each sub table in a designated corner of each cell helps to visualise at a glance the dynamics of change and provides an easy basis for comparison and contrast. The Input-Output Table, even of a static type, is a convincing way of showing the consistency of the Plan.

5. The object of publishing these notes, designed to show the many diverse and complex inter-relationships of a national economic plan, is to provide a better basis for public discussion of many important issues of planning. It is hoped that despite the imperfection of data and the limitation of analysis, the publication of these internal working sheets will meet a genuine need and help to create a better understanding of the Draft Fourth Plan.

6. These notes are the outcome of coordinated work of the entire Perspective Planning Division, working in collaboration with other Divisions of the Planning Commission. The three Joint Directors of the Division, Dr. K. N. Kohli, Shri K. K. Sarin and Dr. A. Vaidyanathan have each played notable part in the organization of the many studies which have gone into their preparation.

Perspective Planning Division,
Planning Commission,
New Delhi, September 1966.

PITAMBAR PANT

Adviser

SECTION ONE

Estimates of National Income by Sectors
India : 1960-61, 1964-65, 1965-66 and 1970-71

National Income Estimates

Introduction

Tables

Explanatory Notes

Trend Estimates of Production for Major Crops, India : 1965-66 and 1970-71

Section One

Estimates of National Income, India: 1960-61, 1964-65, 1965-66 and 1970-71

1. This note presents an estimate of contributions to national income by major sectors of the economy in the years 1960-61, 1964-65, 1965-66 and 1970-71. The position is summarised in Table NI.1. Detailed estimates by sectors are given in Tables NI. 2 to NI. 7. All figures given in this note are at constant prices of 1960-61.

2. The sector-wise estimates of national income for 1960-61 are the same as published in the White Paper on National Income prepared by the Central Statistical Organisation. The estimates of the present detailed study are compared with those given in the *Fourth Five Year Plan—A Draft Outline* (pages 3,61) in the following table.

Estimates of National Income during 1964-65, 1965-66 and 1970-71 as given in Draft Fourth Plan and worked out by PPD

(Rs. abjas at 1960-61 prices)

sector	1964-65		1965-66		1970-71		1970-71 (adjusted)	
	PPD	DO	PPD	DO	PPD	DO	PPD	DO
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. agriculture and allied sectors .	75·1	74·6	64·9	63·9	94·8	95·5	92·9	93·4
2. mining, manufacturing etc. .	33·9	31·9	35·2	33·4	64·0	55·3	60·2	52·6
3. commerce, transport and communications	28·5	28·9	29·6	29·1	43·0	46·9	41·4	44·9
4. other services . . .	30·7	32·0	31·8	34·1	43·0	44·2	41·8	43·0
5. net domestic product at factor cost	168·2	167·4	161·5	160·5	244·8	241·9	236·3	233·9
6. net national income . . .	167·1	166·3	160·3	159·3	241·3	239·0	232·8	231·0

Note: PPD stands for Perspective Planning Division, DO for Draft Outline; and R. abja = Rs. billion = Rs. 100 crores.

3. For 1964-65 and 1965-66 the present estimates are somewhat higher than those in the Draft Outline. The broad group totals also show certain differences.

4. The national income estimate for 1970-71 in the present study totals to Rs. 241·3 abjas which is Rs. 2·3 abjas higher than the estimate of Rs. 239·0 abjas given in the Draft Fourth Plan (page 61). In column 6 of the Table NI·1 an estimate has been made of the sector-wise income if the output levels for 1970-71 as postulated in the Plan are realised with a lag of about 6 months[1]. This yields an estimate of Rs. 232·8 abjas which is Rs. 1·8 abjas more than the estimate of Rs. 231·0 abjas shown in the Draft Outline of the Fourth Five Year Plan.

5. The estimates of the present study are derived from detailed calculations of output and value added of a number of sub-sectors based on the targets of production/activity directly or indirectly implicit in the Fourth Plan. They bear out the national income estimates adopted in the Draft Fourth Plan and show them to be fairly consistent with the programmes and the targets set in the Fourth Plan.

Basis and Limitations of Estimates

6. For a number of sectors including agriculture and allied activities, mining, large scale industry and power, railways, road transport and communications, the estimates up to 1965-66 are based on actual level of production or physical activity as available from published data. For 1970-71 the estimates have been based on the production targets indicated or implied in the Draft Outline. The estimates of income from government are derived from the budgetary data and the projections made by the Planning Commission for the Fourth Plan.

7. For the remaining sectors which include small scale industries, construction, commerce, professions and liberal arts, domestic services and house property, the estimates are subject to larger margins of error, mainly due to the inadequacy of data. This is a general limitation which vitiates not only the projections of future income from the sectors but also the published statistics of national income in the past. The difficulty of working out estimates for the future is, however, greater because the Plan does not provide specific guidance in regard to the growth of these sectors. Independent projections have to be made, using appropriate methods, linking growth in these sectors with the behaviour of other indicators for which information is available and with which the growth of the sector is observed to be related in the past. The bases on which these projections have been made are set out at some length in the Explanatory Notes which follow the Tables.

---

[1] $Y'_{70\text{-}71} = Y_{70\text{-}71} \times \left(1 - \frac{r}{2}\right)$ where r = geometric rate of growth of income of the sector between 1964-65 and 1970-71; Y' and Y are adjusted (col. 6) and estimated (col. 5) values of sectoral income.

Table NI. 1 : Estimates of National Income by Industrial Origin
India : 1960-61, 1964-65, 1965-66 and 1970-71

(Rs. billion (or abja=10^9) at 1960-61 prices)

sector	1960-61	1964-65	1965-66	1970-71 (target basis)	1970-71 (as adopted[1])
(1)	(2)	(3)	(4)	(5)	(6)
1. agriculture including animal husbandry, forestry and fishery	*68·9*	*75·1*	*64·9*	*94·8*	*92·9*
2. mining	1·6	1·9	2·2	4·0	3·7
3. factory establishments including power	13·2	17·9	18·9	38·7	36·0
4. small enterprises	8·2	10·2	10·2	14·8	14·3
5. construction	3·0	3·9	4·0	6·5	6·2
6. total of mining, manufacturing and construction	*26·0*	*33·9*	*35·2*	*64·0*	*60·2*
7. communications	0·6	1·0	1·1	1·8	1·7
8. transport including railways	5·5	7·2	7·5	11·5	11·0
9. organised banking and insurance	1·6	2·3	2·5	3·7	3·5
10. other commerce	15·7	18·0	18·5	26·0	25·2
11. total of commerce, transport and comunications	*23·4*	*28·5*	*29·6*	*43·0*	*41·4*
12. professions, liberal arts and domestic services	9·3	11·2	11·5	16·4	15·9
13. government services	9·0	13·6	14·2	19·2	18·6
14. house property	5·3	5·9	6·1	7·4	7·3
15. total of other services	*23·6*	*30·7*	*31·8*	*43·0*	*41·8*
16. net domestic product	141·9	168·2	161·5	244·8	236·3
17. earned income from abroad	(—)0·5	(—)1·1	(—)1·2	(—)3·5	(—)3·5
18. national income	141·4	167·1	160·3	241·3	232·8

Source : Tables NI.2 to NI.7 and Appendix to Tables.

Note : [1] Estimated on the assumption that output levels for 1970-71 postulated in the Draft Plan will be realised with a lag of about six months.

Table NI. 2 : Gross and Net Value of Output in Agriculture, Animal Husbandry, Fishery and Forestry
India : 1960-61, 1964-65, 1965-66 and 1970-71

(Rs. million at 1960-61 prices)

sector	1960-61		1964-65		1965-66		1970-71	
	gross value	net value	gross value	net value	gross value	net value	gross value	net value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. agriculture[1]	72554	65740	81811	71982	69083	61614	108610	90598
2. animal husbandry[1]	12090		13225		13472		17173	
3. fishery	998	960	849	817	989	951	1592	1532
4. forestry	1186	1127	1375	1306	1423	1352	1780	1690
5. total	86828	67827	97260	74105	84967	63917	129185	93820
6. adjustment[2]		1019		1019		1019		1019
7. total adjusted		68846		75124		64936		94839

Note : [1]Details of output are given in Tables NI. 2·2 and NI. 2·3 respectively. Estimates of inputs are shown in Table NI. 2·4; and [2] Rs. 1019 million have been added to the net value to make it comparable with the official estimates for 1960-61. This amount is repeated in all the years.

Basis of estimate is given in Explanatory Notes.

Table NI. 2·1 : Estimates of Value of Production in Agriculture, India : 1960-61, 1964-65, 1965-66 and 1970-71

(value Rs. million at 1960-61 prices)

commodity	price per tonne (Rs.)	unit of physical production	1960-61		1964-65		1965-66		1970-71	
			quantity	value	quantity	value	quantity	value	quantity	value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. rice . . .	570·35	mil. tonnes	34·2	19505	38·7	22073	30·3	17280	51	29088
2. wheat . . .	423·47	mil. tonnes	11	4677	12·1	5148	not	available	19	8084
3. coarse grains . . .	362·10	mil. tonnes	23·1	8375	25·2	9125	not	available	31	11225
4. pulses . . .	401·69	mil. tonnes	12·7	5082	12·9	5182	not	available	19	7632
5. *total foodgrains* . . .		mil. tonnes	*81*	*37639*	*88·9*	*41528*	*72·3*	*33258*	*120*	*56029*
6. *oil seeds* . . .	*702·00*	mil.tonnes	*6·6*	*4624*	*8·3*	*5827*	*6·1*	*4282*	*10·7*	*7510*
7. sugarcane (gur) . .	408·48	mil. tonnes	10·6	4336	12·3	5024	12·1	4943	13·5	5514
8. cotton . . .	2276·60	thou. tonnes	958	2181	974	2217	850	1935	1548	3525
9. jute . . .	939·00	thou. tonnes	722	678	1,084	1018	806	757	1620	1520
10. tobacco . . .	2811·63	thou. tonnes	427·8	1203	590	1659	636	1788	755	2120
11. tea . . .	2381·65	thou. tonnes	310	807	346	824	376	896	454	1080
12. coffee . . .	2366·00	thou. tennes	62·2	147	60	142	60	42	85	201
13. potato . . .	277·21	mil. tonnes	2·8	762	3·3	915	3·3	915	5·2	1442
14. other fruits and vegetables	—	—	—	4071	—	4890	—	4890	—	6470
15. chillies . . .	1989·73	thou. tonnes	371	740	455	905	413	822	500	994
16. other condiments and spices	—	—	—	899	—	944	—	944	—	1170
17. fodder . . .	—	—	—	992	—	1150	—	1150	—	1500
18. straw . . .	63·37	mil. tonnes	125·5	7886	133·6	8470	109	6906	—	11600
19. other agricultural products	—	—	—	3812	—	4292	—	3633	—	5368
20. rice husk and bran . .	—	—	—	790	—	894	—	700	—	1170

21. rubber . . .	3457·06	thou. tonnes	25·4	88	37	128	40	138	80	277
22. *total other agricultural products (items 7—21)* . .	—	—	—	*29393*	—	*33472*	—	*30559*	—	*43751*
23. total for reporting area .	—	—	—	71654	—	80827	—	68099	—	107490
24. non-reporting area . .	—	—	—	900	—	984	—	984	—	1150
25. total gross value of agriculture	—	—	—	72554	—	81811	—	69083	—	108640

Note: Sources of data for output and prices are given below—

utput Data

1. 1960-61—Government of India, Central Statistical Organisation, National Income Unit.
2. 1964-65—Government of India, Directorate of Economics and Statistics, 'Final Estimates of Principal Crops, 1964-65, published in *Agricultural Situation in India* (April 1966), pp. 68-69.
3. 1965-66—Items 1-5—Directorate of Economics and Statistics, *Preliminary Crop Estimates*;
   Items 6-10— Government of India, Planning Commission, *Fourth Five Year Plan—A Draft Outline* (1966);
   Items 18-20—related with the output of foodgrains and rice respectively;
   Item 21—Government of India, Ministry of Commerce, Plantation Section's Estimates.
4. 1970-71—Government of India, Ministry of Food and Agriculture, *Approach to Agricultural Development in the Fourth Five Year Plan.*
   Government of India, Planning Commission, *Fourth Five Year Plan—A Draft Outline.*

Prices

Unit Prices for 1960-61 obtained from Central Statistical Organisation.

Table NI. 2.2 : Value of Gross Output in Animal Husbandry, India : 1960-61, 1964-65, 1965-66 and 1970-71

(Rs. million at 1960-61 prices)

commodity	price per tonne (Rs.)	unit of physical production	1960-61		1964-65		1965-66		1970-71	
			quantity	value	quantity	value	quantity	value	quantity	value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. milk and milk products .	335·40	million tonnes	22·4	7513	24·2	8117	24·6	8250	32·25	10817
2. meat . . .	1534·00	million tonnes	556	853	640	980	660	1010	793	1216
3. eggs . . .	116·30[1]	million nos.	2048	238	4316	501	4675	544	11000	1280
4. wool . . .	4673·79	thou. tonnes	36	168	36·7	171	37·8	177	42·7	200
5. hides . . .	9·00[2]	millior nos.	20·9	190	22	198	22·2	200	23·2	209
6. skins . . .	381·39[3]	million nos.	46·2	176	48·6	185	49	188	50·1	192
7. other animal husbandry products . . .				2952		3073		3103		3259
8. total gross value . .				12090		13225		13472		17173

Source : 1. Unit prices and output data for 1960-61 obtained from Central Statistical Organisation.

2. Output in 1964-65 interpolated on the basis of expected output increase between 1960-61 to 1965-66.

3. 1965-66 and 1970-71. (i) Government of India, Planning Commission *Fourth Five Year Plan. A Draft Outline.*

(ii) Government of India, Ministry of Food and Agriculture, *Report of the Working Group for Fourth Plan on Animal Husbandry.*

Note : [1] Price per thousand numbers; [2] Price per piece; and [3] Price per 100 nos.

Table NI. 2·3 : Inputs in Agriculture and Animal Husbandry Sector
India : 1960-61, 1964-65, 1965-66 and 1970-71

(Rs. million)

item	1960-61	1964-65	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)
1. *inputs from agriculture*	*15456*	*18622*	*16101*	*25996*
2. seed	3686	4156	3509	5510
3. organic manure	1770	1996	1687	2645
4. livestock feed	10000	12470	10905	17840
5. *inputs from manufacture*	*667*	*1336*	*1710*	*5495*
6. fertilisers	374	825	1063	3730
7. pesticides	64	120	160	560
8. electricity	83	140	210	515
9. fuel oil	146	251	277	690
10. *other inputs*	*2781*	*3096*	*3130*	*3725*
11. market charges	283	319	269	420
12. irrigation charges	250	287	310	360
13. depreciation, repairs, maintenance etc.	2248	2490	2551	2945
14. total inputs	*18904*	*23054*	*20941*	*35215*

Table NI. 3 : Quantity and Value of Mineral Production India : 1960-61, 1964-65, 1965-66 and 1970-71

(quantity in thousand tonnes, value in Rs. million at 1960-61 prices)

	price per tonne (Rs.)	1960-61[1]		1964-65		1965-66		1970-71	
		quantity	value	quantity	value	quantity	value	quantity	value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
mineral fuels									
1. coking and blendable coal—rawcoal raised		15		16·5		19		36	
2. non-coking coal[2]		37		47·9		49		70	
3. total (1+2)	20·7	52	1076·4	64·4	1333·1	68	1407·6	106	2194·2
4. lignite	23·0	46·9	1·1	1570	36·1	2583	59·4	10000	230·0
5. crude oil	60·0	446	26·8	2290	137·4	3500	210·0	9500	570·0
metallic minerals									
6. bauxite	10·6	387	4·1	639	6·8	680	7·2	2600	27·5
7. chromite	57·0	107	6·1	47	2·7	57·5	3·3	150	8·6
8. copper ore	52·9	448	23·7	473	25·0	465	24·6	3500	185·1
9. gold[3]	11400·0	4995	56·9	4632	52·8	3855	43·9	5500	62·7
10. ilmenite	58·8	250	14·7	16·6	1·0	29·2	1·7	100	5·9
11. iron ore	8·5	10683[4]	90·8	15042[4]	127·9	24500	208·3	54000	459·0
12. lead concentrate	357·2	6	2·1	6·1	2·2	5	1·8	50	17·9
13. manganese ore	69·0	1199	82·7	1236	85·3	1562	107·8	3200	220·8
14. silver (kg)[3]	180·0	4128	0·7	4734	0·9	3361	0·6	5500	1·0
15. zinc concentrate	250·9	10	2·5	10·5	2·6	8·5	2·1	100	25·1
non-metallic minerals									
16. asbestos	117·4	1·7	0·2	3	0·4	4·5	0·5	5	0·6
17. barytes	25·3	14	0·3	46	1·2	40	1·0	100	2·5
18. china clay	13·9	378	5·2	429	6·0	497·0	6·9	1300	18·1
19. dolomite	9·2	650	6·0	507	4·7	941·5	8·7	3000	27·6
20. gypsum	6·3	99·7	0·6	850	5·4	1212	7·6	1700	10·7
21. kyanite	199·1	2	0·4	32	6·4	49·5	9·9	100	19·9
22. lime stone[3]	4·4	12·8	56·3	17	74·8	20	88·0	41	180·4
23. magnesite	17·1	156	2·7	208	3·6	237·3	4·1	450	7·7
24. mica-crude	851·7	29	24·7	21	17·9	22·7	19·3	60	51·1
25. salt	19·5	3436	67·0	4415	86·1	4897	95·5	7500	146·3
26. sillimanite	49·4	8·5	0·4	12·4	0·6	12	0·6	50	2·5
27. others (minor minerals)			263·0		300·0		300·0		500·0
28. total (gross)			1815		2321		2620		4975
29. net value added			1630		1857		2095		3980

Source : Monthly Bulletin of Mineral Statistics, Indian Bureau of Mines.

Note : [1]Quantity figures are for calendar years; [2]Coal and limestone expressed in million tonnes; [3]Gold and Silvers quantities expressed in kg and indicate recovered metal. Prices are per kg.; and [4] 1960-61 and 1964-65 quantities do not include output from Goa.

In CSO's White Paper on National Income, the net output has been taken at 90 per cent of the gross value of output. In the *Proposals for Revised Series of National Income*, prepared by the CSO, the net output has been found to be about 80 per cent of the gross value of output of minerals. In the estimates made above the latter ratio has been adopted for arriving at the net value for all years. Consequently the net value estimate for 1960-61 given above works out lower than that given in the White Paper.

Table NI. 4 : Value of Output and Value Added in Organised Industries India : 1960-61, 1964-65, 1965-66, 1970-71 and 1975-76

(Rs. million at 1960-61 prices)

industry	1960-61		1964-65		1965-66		1970-71		1975-76	
	value output	value added	value output	value added	value output	value added	value output	value added	value output	value added
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
census sector										
1. food products	7407	1242	8350	1407	8589	1447	11357	1898	15321	2575
2. textile products	9130	2774	10327	3109	9887	2988	14071	4258	18330	5563
3. rubber and leather products	818	246	1220	368	1318	396	3310	992	5953	1783
4. paper, wood etc. products	1635	567	2294	793	2648	917	4240	1457	7064	2389
5. non-metallic mineral products	1780	571	2388	771	2607	834	5777	1872	9448	3079
6. chemicals and chemical products	2007	603	3765	1129	4041	1217	12769	3630	22925	6468
7. metals and primary products	3250	840	5892	1503	6141	1542	18141	4504	30374	7755
8. electrical engineering	945	303	1718	535	1905	628	5916	1851	9793	3112
9. electronics	56	17	102	31	121	38	1040	554	2410	1074
10. transport equipment	2618	868	4376	1515	4713	1659	9186	3177	14879	5065
11. machinery	1235	420	2575	899	3237	1139	10968	4002	19497	7328
12. miscellaneous	222	69	309	96	325	101	695	215	1119	347
13. total census sector	31103	8520	43316	12156	45532	12906	97475	28410	157113	46338
sample sector										
14. gross of depreciation	7461	1455	10108	2080	10706	2247	21860	4949	35572	8094
15. sample sector (net)	7461	1288	10108	1841	10706	1989	21860	4380	35572	7163
16. electricity supply—utilities	1053	737	1727	1209	1928	1350	4655	3259	7735	5415
17. adjustment for coverage		2655		2655		2655		2655		2655
18. grand total (13+15+16+17)	39617	13200	55151	17861	58166	18900	123990	38704	200420	61571

Source : For 1960-61, 1964-65 and 1965-66—(1) Monthly Statistics of Production of Selected Industries; (2) Director General, Technical Development—Annual Reports. For 1970-71—Draft Fourth Five Year Plan. For 1975-76—Perspective Planning Division estimates.

Note : Estimates of sample sector worked out on the assumption that production of each major group of industries in this sector will grow at the same rate as that of the census sector industries. Net value added in row 15 derived by deducting from gross value added in row 14 estimated depreciation at 11·5 per cent of gross value added.

M/S153PC—3(a)

Table NI. 4·1 : Estimate of Production, Value of
India : 1960-61, 1964-65,

industry	unit	production				
		1960-61	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. *food products*						
2. sugar	thou. tonnes	3030	3260	3402	4500	6800
3. tea	thou. tonnes	317	372	357	470	570
4. salt	thou. tonnes	3500	4415	4897	8000	10000
5. cigarettes, cigars . .	bil. nos.	40·4	49	57	60	80
6. others	Rs. million	3024	3409	3508	4806	6255
7. *textile products*						
8. cotton fabrics (mill made) .	mil. metres	4649	4676	4400	5486	7000
9. cotton yarn (for sale) .	thou. tonnes	253	340	355	600	800
10. woollen fabrics . . .	mil. metres	13	11·2	9·1	37·3	70
11. jute manufactures . .	thou. tonnes	1071	1292	1302	1700	2000
12. others	Rs. million	1553	1927	1677	2394	3118
13. *rubber and leather products*						
14. auto tyres . . .	thou. nos.	1440	2150	2308	6000	11000
15. auto tubes . . .	thou. nos.	1352	2190	2267	6000	11000
16. bicycle tyres . . .	mil. nos.	11·2	16·5	18·5	33	50
17. bicycle tubes . . .	mil. nos.	13·3	16·1	18·5	33	50
18. dipped rubber goods and contraceptives. . .	Rs. million	47	72	80	170	300
19. others	Rs. million	413	616	665	1722	3107
20. *paper, wood etc. products*						
21. paper and paper board .	thou. tonnes	350	495	560	900	1700
22. newsprint . . .	thou. tonnes	23	30	30	150	300
23. plywood	mil. sq. metres	15	20	23	31	44
24. matches	mil. boxes	5400	4044	5293	6000	7500
25. rayon filaments . .	thou. tonnes	22	35	38	67	70
26. staple fibre . . .	thou. tonnes	21	37	38	35	90
27. chemical pulp, rayon grade	thou. tonnes	—	—	48	110	200
28. others	Rs. million	638	900	1040	1649	2730
29. *non-metallic products*						
30. cement	thou. tonnes	8000	9800	10820	20000	30000
31. glass	thou. tonnes	229	201	280	500	750
32. petroleum products . .	thou. tonnes	5800	8400	9444	20000	35000
33. lubricating oils . .	thou. tonnes	21	38·3	60	827	1200
34. refractories . . .	thou. tonnes	567	703	674	1500	2500
35. cement asbestos . .	thou. tonnes	217	388	389	750	1200
36. others	Rs. million	208	299	287	678	1160
37. *chemicals and chemical products*						
38. fertilizers—nitrogenous .	thou. tonnes (N)	99	234	225	2000	4000
39. fertilizers—phosphatic .	thou. tonnes ($P_2 O_5$)	54	131	121	1000	1700

Output and Value Added in Organised Industries 1965-66, 1970-71 and 1975-76

(value at 1960-61 prices)

price per unit		value of production (Rs. million)					va/v	value added (Rs. million)				
unit	price (Rs.)	1960-61	1964-65	1965-66	1970-71	1975-76		1960-61	1964-65	1965-66	1970-71	1975-76
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
		7407	*8350*	*8589*	*11357*	*15321*		*1242*	*1407*	*1447*	*1898*	*2575*
tonne	767	2324	2500	2609	3452	5216	21	488	525	548	725	1095
tonne	4790	1518	1782	1710	2251	2730	24	364	428	410	540	655
tonne	16	56	71	78	128	160	65	36	46	51	83	104
thou. nos.	12	485	588	684	720	960	23	112	135	157	166	221
		3024	3409	3508	4806	6255	8	242	273	281	384	500
		9130	*10327*	*9887*	*14071*	*18330*		*2774*	*3109*	*2988*	*4258*	*5563*
metre	0·94	4370	4395	4136	5157	6580	34	1486	1494	1406	1753	2237
tonne	5890	1490	2003	2091	3534	4712	34	507	681	711	1202	1602
metre	15·6	203	175	142	582	1092	30	61	53	43	175	328
tonne	1414	1514	1827	1841	2404	2828	24	363	438	442	577	679
		1553	1927	1677	2394	3118	23	357	443	386	551	717
		818	*1220*	*1318*	*3310*	*5953*		*246*	*368*	*396*	*992*	*1783*
no.	190	274	409	438	1140	2090	36	99	147	158	410	752
no.	18·7	25	41	42	112	206	36	9	15	15	40	74
no.	3·5	39	58	65	116	175	36	14	21	23	42	63
no.	1·5	20	24	28	50	75	36	7	9	10	18	27
		47	72	80	170	300	30	14	22	24	51	90
		413	616	665	1722	3107	25	103	154	166	431	777
		1635	*2294*	*2648*	*4240*	*7064*		*567*	*793*	*917*	*1457*	*2389*
tonne	1500	525	742	840	1350	2550	28	147	208	235	378	714
tonne	900	21	27	27	135	270	28	6	8	8	38	76
sq. metre	4·2	63	84	97	130	185	33	21	28	32	43	61
thou. boxes	20	108	81	106	120	150	44	48	36	47	53	66
tonne	9200	202	322	350	616	644	39	79	126	136	240	251
tonne	3725	78	138	140	130	335	39	30	54	55	51	131
tonne	1000	—	—	48	110	200	40	—	—	19	44	80
		638	900	1040	1649	2730	37	236	333	385	610	1010
		1780	*2388*	*2607*	*5777*	*9448*		*571*	*771*	*834*	*1872*	*3079*
tonne	72	576	706	779	1440	2160	25	144	177	195	360	540
tonne	550	126	111	154	275	413	38	48	42	58	105	157
tonne	120	696	1008	1133	2400	4200	32	223	323	362	768	1344
tonne	600	13	23	36	496	720	32	4	7	12	158	230
tonne	150	85	105	101	225	375	41	35	43	41	92	154
tonne	350	76	136	117	263	420	37	28	50	43	97	155
		208	299	287	678	1160	43	89	129	123	292	499
		2007	*3765*	*4041*	*12769*	*22925*		*603*	*1129*	*1217*	*3630*	*6468*
tonne	1200	119	281	270	2400	4800	22	26	62	59	528	1056
tonne	1140	62	149	138	1140	1938	22	14	33	30	251	426

Table NI. 4·1 : Estimate of Production, Value of
India : 1960-61, 1964-65,

industry	unit	production				
		1960-61	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)
chemicals and chemical products—contd.						
40. sulphuric acid	thou. tonnes	368	695	653	2400	4500
41. nitric acid	thou. tonnes	5	12·8	16	60	100
42. caustic soda	thou. tonnes	101	192	217	500	800
43. soda ash	thou. tonnes	152	286	331	600	900
44. liquid chlorine	thou. tonnes	55	51	51	150	600
45. calcium carbide	thou. tonnes	10	44·3	50	60	80
46. titanium dioxide	thou. tonnes	3	4·3	6	15	25
47. sodium hydrosulphite	thou. tonnes	2	3·8	4·1	10	20
48. oxygen	mil. cu. metres	23	25·5	29	90	135
49. acetylene	mil. cu. metres	3	4·5	5·2	14	20
50. alcohol	thou. tonnes	78	128	145	240	270
51. benzene	thou. tonnes	13	19	22	110	250
52. acetic acid	thou. tonnes	2	7	8	22	50
53. methanol	thou. tonnes	—	—	—	33	60
54. phthalic anhydride	thou. tonnes	—	—	—	15	45
55. carbon black	thou. tonnes	—	11	13	50	100
56. caprolactum	thou. tonnes	—	—	—	20	36
57. formaldehyde	thou. tonnes	—	11·3	17	65	100
58. di-methyl terephthalate (DMT)	thou. tonnes	—	—	—	12	35
59. styrene monomer	thou. tonnes	—	8·4	10	50	90
60. plasticizers	thou. tonnes	1	1·3	2·3	14	30
61. rubber chemicals	thou. tonnes	2	2	3	6	12
62. other organic chemicals and intermediates	thou. tonnes	26	50	60	250	500
63. pesticides, fungicides and weedicides	thou. tonnes	2	9·5	15	100	180
64. dyestuffs	thou. tonnes	5	4·5	4·5	14	20
65. drugs and pharmaceuticals	Rs. million	600	1350	1500	2500	3500
66. plastics (PVC, polythene, polystyrene)	thou. tonnes	10	35	40	200	400
67. synthetic fibres	thou. tonnes	—	1	1·5	40	100
68. synthetic rubber	thou. tonnes	—	12	14	30	90
69. paints and varnishes	thou. tonnes	53	75	71	140	250
70. soap	thou. tonnes	142	167	163	250	400
71. naphtha cracking units (ethylene, propylene, xylene)	thou. tonnes	—	—	—	600	1100
72. cosmetics	Rs. million	90	150	150	250	400
73. others	Rs. million	137	257	275	800	1575
74. *metals and primary products*						
75. steel ingots	thou. tonnes	3480	6140	6525	11700	21500
76. mild steel—finished including electrical steel sheets	thou. tonnes	2400	4430	4425	8800	15500

Output and Value Added in Organised Industries 1265-66, 1970-71 and 1975-76—*contd.*

(value at 1960-61 prices)

price per unit		value of production (Rs. million)					va/v	value added (Rs. million)				
unit	price (Rs.)	1960-61	1964-65	1965-66	1970-71	1975-76		1960-61	1964-65	1965-66	1970-71	1975-76
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
tonne	150	55	104	98	360	675	33	18	34	32	119	223
tonne	1400	7	18	22	84	140	32	2	6	7	27	45
tonne	690	70	132	150	345	552	33	23	44	50	114	182
tonne	375	57	107	124	225	338	33	19	35	41	74	112
tonne	440	24	22	22	66	264	32	8	7	7	21	84
tonne	800	8	35	40	48	64	40	3	14	16	19	26
tonne	2800	8	12	17	42	70	32	3	4	5	13	22
tonne	4650	9	18	19	47	93	29	3	5	6	14	27
thou.cu.m.	1200	28	31	35	108	162	29	8	9	10	31	47
thou.cu.m.	2000	6	9	10	28	40	29	2	3	3	8	12
tonne	250	20	32	36	60	68	29	6	9	10	17	20
tonne	500	7	9	11	55	125	29	2	3	3	16	36
tonne	2000	4	14	16	44	100	29	1	4	5	13	29
tonne	600	—	—	—	20	36	29	—	—	—	6	10
tonne	2000	—	—	—	30	90	29	—	—	—	9	26
tonne	1200	—	13	16	60	120	29	—	4	5	17	35
tonne	6500	—	—	—	130	234	29	—	—	—	38	68
tonne	1280	—	14	22	83	128	29	—	4	6	24	37
tonne	4000	—	—	—	48	140	29	—	—	—	14	41
tonne	1500	—	13	15	75	135	29	—	4	4	22	39
tonne	3000	3	4	7	42	90	29	1	1	2	12	26
tonne	10000	20	20	30	60	120	29	6	6	9	17	35
tonne	1800	47	90	108	450	900	29	14	26	31	130	261
tonne	4000	8	38	60	400	720	29	2	11	17	116	209
tonne	26000	130	117	117	364	520	35	46	41	41	127	182
		600	1350	1500	2500	3500	33	198	446	495	825	1155
tonne	3000	30	105	120	600	1200	29	9	30	35	174	348
tonne	12000	—	12	18	480	1200	39	—	5	7	187	468
tonne	3000	—	36	42	90	270	33	—	12	14	30	89
tonne	2750	146	206	195	385	688	26	38	54	51	100	179
tonne	2200	312	367	358	550	880	29	90	106	104	160	255
tonne	500	—	—	—	300	550	32	—	—	—	96	176
		90	150	150	250	400	34	31	51	51	85	136
		137	257	275	800	1575	22	30	56	61	176	346
		3250	*5892*	*6141*	*18141*	*9374*		*840*	*1503*	*1542*	*4504*	*7555*
tonne	550	1320	2436	2434	4840	8525	27	356	658	657	1307	2302

Table NI. 4·1 : Estimate of Production, Value of
India : 1960-61, 1964-65,

industry	unit	production				
		1960-61	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)
metals and primary Products—contd.						
77. steel castings and forgings	thou. tonnes	34	55	56·7	550	850
78. steel pipes and tubes	thou. tonnes	112	260	241	900	1500
79. pig iron	thou. tonnes	4310	6700	7166	12700	23000
80. pig iron for sale	thou. tonnes	1120	1050	1200	3000	5260
81. grey iron castings	thou. tonnes	—	600	600	2000	3000
82. cast iron pipes	thou. tonnes	213	231	250	1100	1800
83. aluminium (ingots)	thou. tonnes	18·3	54·1	61·3	330	450
84. copper (ingots)	thou. tonnes	8·5	9·4	9·4	37·5	70
85. lead (ingots)	thou. tonnes	3·8	3·5	2·5	9	40
86. zinc (ingots)	thou. tonnes	—	—	4·2	70	100
87. non-ferrous alloys	thou. tonnes	21·5	30·5	35	40	50
88. aluminium sheets	thou. tonnes	26·8	22·5	25	75	125
89. brass, copper sheets and circles	thou. tonnes	31	22	11	25	40
90. zinc sheets	thou. tonnes	3·5	5	4·2	15	25
91. ferro-manganese	thou. tonnes	91	130	150	300	400
92. ferro-silicon	thou. tonnes	7·1	18	20	55	100
93. alloy and special steel-finished	thou. tonnes	—	23·4	35	400	700
94. steel structural fabrications	thou. tonnes	229	284	300	1100	2000
95. steel wire ropes	thou. tonnes	n.a.	10	12	45	90
96. cast iron rolls	thou. tonnes	—	—	—	40	90
97. hurricane lanterns	mil. nos.	5·3	5·3	5·5	8	10
98. razor blades	mil. nos.	602	934	909	1500	2000
99. steel furniture	thou. tonnes	26	40	42	100	150
100. utensils	thou. tonnes	10	10·8	15	30	40
101. others	Rs. million	622	1028	1151	3271	5687
102. *electrical engineering* turbo —generators						
103. —steam	thou. kw	—	—	—	1400	2600
104. —hydro	thou. kw	—	—	—	800	1600
electrical transformers						
105. —upto 33 kv	mil. kva	1·4	3·6	3·3	5	9
106. —above 33 kv	mil. kva	—	—	1·1	7	12
electric motors						
107. —below 150 kw	thou. kw	540	1100	1160	3500	5050
108. —above 150 kw	thou. kw	—	—	150	1000	1250
109. control gears and switch-gears	Rs. million	40	46·5	170	400	750
110. house service meters	thou. nos.	510	1127	1114	3000	3500
111. VIR and PVC cables	mil. metres	195	379	367	1200	2000
112. ACSR conductors	thou. tonnes	23·7	48·8	41	125	160
113. winding wires	thou. tonnes	4·6	8·5	9·1	40	60
114. paper insulated cables	k. metres	992	3160	4477	20000	25000
115. dry core cables	k. metres	1733	3300	3000	16000	20000
116. coaxial cables	k. metres	91·7	150	160	600	800

Output and Value Added in Organised Industries 1965-66, 1970-71 and 1975-76—*contd.*

(value at 1960-61 prices)

price per unit		value of production (Rs. million)					va/v	value added (Rs. million)				
unit	price (Rs.)	1960-61	1964-65	1965-66	1970-71	1975-76		1960-61	1964-65	1965-66	1970-71	1975-76
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
tonne	1475	50	81	84	811	1254	22	11	18	18	178	276
tonne	1180	132	307	284	1062	1770	19	25	58	54	201	336
tonne	160	179	168	192	480	842	27	48	45	52	130	227
tonne	985	—	591	591	1970	2955	22	—	130	130	433	650
tonne	550	117	127	138	605	990	34	40	51	47	206	337
tonne	3000	55	162	184	990	1350	23	13	37	42	228	310
tonne	2825	24	27	27	106	198	23	6	6	6	24	45
tonne	1180	4	4	3	11	47	23	1	1	1	3	11
tonne	1300	—	—	5	91	130	23	—	—	1	21	30
tonne	4000	86	122	140	160	200	23	20	28	32	37	46
tonne	4500	121	101	112	338	562	20	24	20	22	68	112
tonne	3900	121	86	43	98	156	25	30	22	11	24	39
tonne	1970	7	10	8	30	49	25	2	21	2	8	12
tonne	840	76	109	126	252	336	26	20	28	33	65	87
tonne	940	7	17	19	52	94	26	2	4	5	14	24
tonne	3500	—	82	122	1400	2450	27	—	22	33	378	662
tonne	985	226	280	296	1084	1970	35	79	98	104	379	690
tonne	2700	—	27	32	122	243	25	--	7	8	31	61
tonne	1600	—	—	—	64	144	22	—	—	—	14	32
no.	3	16	16	16	24	30	31	5	5	5	7	9
thou. nos.	15	9	14	14	22	30	30	3	4	4	7	9
tonne	1100	29	44	46	110	165	42	12	18	19	46	69
tonne	4920	49	53	74	148	197	50	25	27	37	74	98
		622	1028	1151	3271	5687	19	118	195	219	621	1081
		945	*1718*	*1905*	*5916*	*9793*		*303*	*535*	*628*	*1851*	*3112*
kw	120	—	—	--	168	312	30	—	—	—	50	94
kw	100	—	—	—	80	160	30	—	—	—	24	48
kva	50	70	180	165	250	450	30	21	54	50	75	135
kva	22	—	—	24	154	264	30	—	—	7	46	79
kw	125	68	137	145	437	631	30	20	41	44	131	189
kw	125	—	—	19	125	156	30	--	—	6	38	47
		40	47	170	400	750	40	16	19	68	160	300
no.	41	21	46	46	123	144	70	15	32	32	86	101
thou. metres	620	121	235	228	744	1240	24	29	56	55	179	298
tonne	3570	85	174	146	446	571	10	9	17	15	45	57
tonne	7675	35	65	70	307	461	24	8	16	17	74	111
k.metre	19000	19	60	85	380	475	24	5	14	20	91	114
k.metre	6250	11	21	19	100	125	24	3	5	5	24	30
k.metre	12500	1	2	2	8	10	24	neg.	neg.	neg.	2	2

Table NI. 4·1 : Estimate of Production, Value of
India : 1960-61, 1964-65,

industry	unit	production				
		1960-61	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)
electrical engineering—contd.						
117. arc welding electrodes .	mil. r. metres	110	238	201	500	700
118. air conditioners . .	thou. nos.	10·7	10·3	12·4	65	130
119. water coolers . . .	thou. nos.	2·2	2·4	3·7	30	50
120. domestic refrigerators .	thou. nos.	11·4	30·5	31	65	200
121. electric fans . . .	thou. nos.	1060	1276	1360	3500	5500
122. dry batteries . . .	mil. nos.	214	299	293	600	900
123. storage batteries . .	thou. nos.	521	773	709	1800	3000
124. electric lamps (including miniature lamps).	mil. nos.	43	98	100	185	500
125. flourescent tubes . .	mil. nos.	1·7	3·2	4·4	20	100
126. others	Rs. million	137	246	276	855	1426
127. *electronics*						
128. raw materials and components of which : .	Rs. million	—	—	n.a.	300	550
129. tubes and transistors .	Rs. million	—	—	n.a.	120	220
130. resistors, capacitors, switches and relays .	Rs. million	—	—	n.a.	80	130
131. electronic measuring and testing instruments .	Rs. million	—	—	n.a.	50	100
132. transmitters, industrial heating, railway signalling and other industrial equipment . . .	Rs. million	—	—	n.a.	250	450
133. radio receivers . .	thou. nos.	280	512	606	1500	3500
134. public address system and other consumer items . . .	Rs. million	—	—	n.a.	200	400
135. *transport equipment*						
136. passenger coaches . .	nos.	1300	1850	1900	2000	2300
137. wagons	thou. nos.	12	34	34	40	55
138. steam locomotives . .	nos.	272	221	203	47	—
139. diesel locomotives (including shunters) .	nos.	—	18	39	250	350
140. electric locomotives .	nos.	—	27	32	150	250
141. commercial vehicles . .	thou. nos.	28·4	37	35	80	150
142. cars, jeeps and station wagons	thou. nos.	27	34	35	70	120
143. motor cycles and scooters .	thou. nos.	19	37·4	44	120	200
144. automobile ancillaries .	Rs. million	90	330	490	1000	1500
145. bicycles complete . .	thou. nos.	1071	1442	1581	3500	4500
146. bicycle parts . . .	Rs. million	54	89	95	200	300
147. ship building . . .	thou. GRT	6·7	50	50	100	200
148. others	Rs. million	816	1366	1511	2921	4769

Output and Value Added in Organised Industries 1965-66, 1970-71 and 1975-76—*contd.*

(value of 1960-61 prices)

price per unit		value of production (Rs. million)					va/v	value added (Rs. million)				
unit	price (Rs.)	1960-61	1964-65	1965-66	1970-71	1975-76		1960-61	1964-65	1965-66	1970-71	1975-76
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
thou. metres	200	22	48	40	100	140	40	9	19	16	40	56
no.	2400	26	25	30	156	312	42	11	10	13	66	131
no.	2190	5	5	8	66	110	42	2	2	3	28	46
no.	1610	18	49	50	105	322	42	8	21	21	44	135
no.	108	114	138	147	378	594	34	39	47	50	128	202
thou. nos.	370	79	111	108	222	333	34	27	38	37	75	113
no.	88	46	68	62	158	264	42	19	29	26	66	111
thou. nos.	530	23	52	53	98	265	33	8	17	17	32	87
thou. nos.	2780	4	9	12	56	278	25	1	2	3	14	70
		137	246	276	855	1426	39	53	96	123	333	556
		56	*102*	*121*	*1040*	*2410*		*17*	*31*	*38*	*554*	*1074*
		—	—	n.a.	300	550	60	—	—	n.a.	180	330
		—	—	n.a.	120	220						
		—	—	n.a.	80	130						
		—	—	n.a.	50	100	60	—	—	n.a.	30	60
		—	—	n.a.	250	450	60	—	—	n.a.	150	270
no.	200[1]	56	102	121	240	560	31	17	31	38	74	174
		—	—	n.a.	200	400	60	—	—	n.a.	120	240
		2618	*4376*	*4713*	*9186*	*14879*		*868*	*1515*	*1659*	*3177*	*5065*
no.	130000	169	240	247	260	299	40	68	96	99	104	120
no.	17000	204	578	578	680	935	40	82	231	231	272	374
no.	415000	113	92	84	20	—	48	54	44	40	10	—
no.	1450000	—	26	57	363	508	48	—	12	27	174	244
no.	1050000	—	28	34	158	262	48	—	13	16	76	126
no.	25000	710	925	875	2000	3750	24	170	222	210	480	900
no.	10000	270	340	350	700	1200	24	65	82	84	168	288
no.	1700	32	64	75	204	340	28	9	18	21	57	95
		90	330	490	1000	1500	40	36	132	196	400	600
no.	137	147	198	217	480	616	28	41	55	61	134	172
		54	89	95	200	300	50	27	45	48	100	150
GRT	2000	13	100	100	200	400	46	6	46	46	92	184
		816	1366	1511	2921	4769	38	310	519	574	1110	1812

Table NI.4·1 : Estimate of Production, Value o
India : 1960-61, 1964-65,

industry	unit	production				
		1960-61	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)
149. *machinery*						
150. coal and other mining machinery	thou. tonnes	—	2·3	7	50	90
151. cotton textile machinery	Rs. million	104	216	280	550	650
152. jute textile machinery	Rs. million	17	32	35	80	150
153. sugar machinery	Rs. million	44	88	76	160	250
154. cement machinery	Rs. million	6	22	35	200	300
155. paper machinery	Rs. million	neg.	15	20	200	300
156. printing machinery	Rs. million	—	0·2	1	50	150
157. equipment for chemical industry	Rs. million	15	67·3	80	360	800
158. heavy plate and vessel works	thou. tonnes	—	—	—	50	120
159. metallurgical and other heavy equipment	thou. tonnes	—	2·7	11	70	160
160. dairy machinery	Rs. million	2	6	10	50	90
161. tea processing machinery	Rs. million	12	15	11	21	45
162. building and road construction machinery	Rs. million	15	24	27	180	300
163. power boilers	tonne/st. hr.	—	—	neg.	5600	11000
164. industrial boilers	Rs. million	5	51	46	250	400
165. agricultural tractors	thou. nos.	—	2·7	5·6	35	150
166. diesel engines (stationary)	thou. nos.	45	74	92	200	300
167. power driven pumps	thou. nos.	109	184	238	400	500
168. air compressors	Rs. million	15	36	35	160	250
169. machine tools	Rs. million	70	239	292	1050	1600
170. road rollers	nos.	388	1096	1123	1600	2200
171. crawler tractors	nos.	—	—	—	650	1200
172. shovels and excavators	nos.	—	—	—	225	350
173. dumpers and scrapers	nos.	—	—	50	650	1200
174. grinding wheels	thou. tonnes	2	3·3	4	10	20
175. precision, surgical and mathematical instruments	Rs. million	30	90	90	450	1000
176. ball and roller bearings	mil. nos.	3·2	6	9	30	60
177. heavy pumps and compressors	thou. tonnes	—	—	—	15	40
178. bolts, nuts and rivets	thou. tonnes	43	34	45	100	160
179. cranes	thou. tonnes	2	12·3	15	75	100
180. typewriters	thou. nos.	23·5	44·7	40	200	300
181. sewing machines	thou. nos.	303	330	433	900	1800
182. watches, clocks and time pieces	thou. nos.	51	280	590	2480	6000
183. others	Rs. million.	340	713	891	2963	5286
184. *miscellaneous*	Rs. million.	*222*	*309*	*325*	*695*	*1119*
185. *total industry*	Rs. million.	*31103*	*43316*	*45532*	*97475*	*157113*
186. *electricity sold*[2]	mil. kwh.	*13953*	*22881*	*25531*	*61660*	*102450*

For source see Table NI. 4.

Note: [1]Estimated at Rs. 160 in 1970-71 and 1975-76 with higher proportion of cheaper sets; and

[2] The figures of production represent the actual amount of electricity sold. They are net of losses and self generation. (See

The ratios of net value to value of output and price per unit have, mostly been based on data from *Annual Survey of*

Output and Value Added in Organised Industries
1965-66, 1970-71 and 1975-76—*concld.*

(value at 1960-61 prices)

price per unit		value of production (Rs. million)					va/v	value added (Rs. million)				
unit	price (Rs.)	1960-61	1964-65	1965-66	1970-71	1975-76		1960-61	1964-65	1965-66	1970-71	1975-76
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
		1235	*2575*	*3237*	*10968*	*19497*		*420*	*899*	*1139*	*4002*	*7328*
tonne	4400	—	10	31	220	396	44	—	4	14	97	174
		104	216	280	550	650	35	36	76	98	192	228
		17	32	35	80	150	34	6	11	12	27	51
		44	88	76	160	250	30	13	26	23	48	75
		6	22	35	200	300	40	2	9	14	80	120
		neg.	15	20	200	300	45	—	7	9	90	135
		—	—	1	50	150	40	—	—	—	20	60
		15	67	80	360	800	42	6	28	34	151	336
tonne	3000	—	—	—	150	360	40	—	—	—	60	144
tonne	6000	—	16	66	420	960	40	—	6	26	168	384
		2	6	10	50	90	40	1	2	4	20	36
		12	15	11	21	45	31	4	5	3	7	14
		15	24	27	180	300	20	3	5	5	36	60
tonne/st.hr.	62500	—	—	—	350	688	40	—	—	—	140	275
		5	51	46	250	400	40	2	20	18	100	160
no.	7000	—	19	39	245	1050	61	—	12	24	149	641
no.	2050	92	152	189	410	615	40	37	61	76	164	246
no.	2500	272	460	595	1000	1250	35	95	161	208	350	438
		15	36	35	160	250	29	4	10	10	46	73
		70	239	292	1050	1600	41	29	98	120	431	656
no.	40000	16	44	45	64	88	20	3	9	9	13	18
no.	100000	—	—	—	65	120	61	—	—	—	40	73
no.	100000	—	—	—	23	35	20	—	—	—	5	7
no.	100000	—	—	5	65	120	20	—	—	1	13	24
tonne	5950	12	20	24	60	119	40	5	8	10	24	48
		30	90	90	450	1000	46	14	41	41	207	460
no.	5·6	18	34	50	168	336	25	5	8	12	42	84
tonne	7000	—	—	—	105	280	48	—	—	—	50	134
tonne	1970	85	67	89	197	315	27	23	18	24	53	85
tonne	3900	8	48	58	293	390	34	3	16	20	100	133
no.	760	18	34	30	152	228	34	6	12	10	52	78
no.	120	36	40	52	108	216	46	17	18	24	50	99
no.	60	3	17	35	149	360	39	1	7	14	58	140
		340	713	891	2963	5286	31	105	221	276	919	1639
		222	*309*	*325*	*695*	*1119*	*31*	*69*	*96*	*101*	*215*	*347*
		31103	*43316*	*45532*	*97475*	*157113*		*8520*	*12156*	*12906*	*28410*	*46338*
hou. kwh.	75·5	*1053*	*1727*	*1928*	*4655*	*7735*	*70*	*737*	*1209*	*1350*	*3259*	*5415*

Table MB. 3 for allowances on account of losses and self generation).
Industries, 1960.

Table NI. 5 : Estimates of Income from Small Enterprizes and Construction India : 1960-61, 1964-65, 1965-66 and 1970-71

(Rs. million at 1960-61 prices)

industrial group	1960-61	1964-65	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)
1. textile and tailoring	2550	3350	3280	4710
2. leather and leather products	700	740	745	765
3. food, drink and tobacco	1250	1480	1340	1710
4. wood, glass, stone and ceramics, metal manufacturing and engineering	3210	4120	4260	6930
5. other industries	480	550	530	720
6. *total small interprizes*	*8190*	*10240*	*10155*	*14835*
7. construction	3010	3860	3990	6500
8. *total*	*11200*	*14100*	*14145*	*21335*

Note : For basis of estimates see Appendix to the Tables.

Table NI. 6 : Estimates of Income from Transport Sector India : 1960-61, 1964-65, 1965-66, and 1970-71

(Rs. million at 1960-61 prices)

item	1960-61	1964-65	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)
1. railways[1]	3580	4484	4728	6933
2. road transport[2]	1226	1879	2037	3441
3. air transport	60	82	85	140
4. other transport[3]	654	740	620	980
5. *total*	*5520*	*7185*	*7470*	*11494*

Note : [1]For details see Table NI-6·1; [2] For details see Table NI-6·2; [3] Increase has been related to the increase in gross value of output in agriculture.

Table NI. 6·1 : Income from Railways India : 1960-61, 1964-65, 1965-66 and 1970-71

(at 1960-61 prices)

item	unit	1960-61	1964-65	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)	(6)
goods traffic					
1. total traffic	million tonne-km	87680	106570	114000	170000
2. non-revenue earning traffic	million tonne-km	15347	13118	15500	15900
3. revenue earning traffic	million tonne-km	72333	93452	98500	155100
4. average rate	paisa per tonne-km	3·95	3·95	3·95	3·95
5. revenue from goods traffic	Rs. million	2861	3691	3891	6126
passenger traffic					
6. total traffic	million passenger km	77665	93489	98000	122000
7. average rate	paisa per passenger km	1·69	1·69	1·69	1·69
8. revenue from passenger traffic	Rs. million	1316	1580	1656	2062
9. total earnings from goods and passenger traffic (item 5 plus item 8)	Rs. million	4177	5271	5547	8188
10. miscellaneous earnings[1] of railways	Rs. million	391	448	483	655
11. *total earnings of railways*	*Rs. million*	*4568*	*5719*	*6030*	*8843*
12. income generated through railways[2]	Rs. million	3580	4484	4728	6933

Note : Figures for 1960-61 and 1964-65 are actuals; for 1965-66 and 1970-71, as given by the Railway Board/Transport Division.

[1] Includes sundry and other coaching earnings. These were 9·3 and 8·5 per cent of total revenue from goods and passenger traffic in the years 1960-61 and 1964-65 respectively and are budgetted at 8·7 per cent for 1965-66 and 8·4 per cent for 1966-67. It is assumed that their proportion to passenger and goods earnings would decline to 8·0 per cent in 1970-71; and [2]According to National Income Estimates of the C.S.O.), income generated from Railways was 78·4 per cent of total earnings in 1960-61. It is assumed that this percentage will hold good for future years.

Table NI. 6·2 : Income from Road Transport
India : 1960-61, 1964-65, 1965-66 and 1970-71

(at 1960-61 prices)

items	unit	1960-61	1964-65	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)	(6)
goods traffic					
1. volume of goods traffic	bill. tonne-kms	17	30	33	60
2. average earnings	paise-per tonne-km	10	10	10	10
3. gross earnings from goods traffic	Rs. million	1700	3000	3300	6000
4. deduct 20% of above (row 3) representing earnings of trucks owned by project authorities, industries etc. included elsewhere[1]	Rs. million	340	600	660	1200
5. net earnings from goods traffic	Rs. million	1360	2400	2640	4800
passenger traffic					
6. volume of passenger traffic	bill. passenger-kms	56	75	80	120
7. average earnings	paise per passenger km	3	3	3	3
8. total gross earnings from passenger traffic	Rs. million	1680	2250	2400	3600
9. deduct 3% of above (row 8) representing earnings of buses owned by private institutions[1]	Rs. million	50	68	72	108
10. total net earnings from passenger traffic	Rs. million	1630	2182	2328	3592
11. *total earnings from goods and passenger traffic*	*Rs. million*	*2990*	*4582*	*4968*	*8392*
12. net income[2]	Rs. million	1226	1879	2037	3441

Notes[1] Assumed ; and [2]The ratio of net earnings to gross earnings has been taken at 41 percent as worked out on the basis of information obtained from Statistical Bulletin of State Road Transport Undertakings in India for 1959-60.

Table NI. 7 : Income Originated by Government Services
India : 1960-61, 1964-65, 1965-66 and 1970-71

(Rs. million)

item	1960-61	1964-65	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)
1. current expenditure of the Centre and States excluding capital outlay on defence	16490	29320	34250	50910
2. current expenditure of local bodies[1]	970	1180	1240	1580
3. *total current expenditure of government*	*17460*	*30500*	*35490*	*52490*
4. deduct transfers from revenue to capital	—	250	300	540
5. deduct interets on debt including appropriation for reduction and avoidance of debt	2030	4090	4940	10190
6. deduct transfer payments	2380	2800	3000	4500
7. deduct subsidies	1040	1400	1500	2500
8. *government expenditure* (net)	*12010*	*21960*	*25750*	*34760*
9. income from government services[2]	9070	14800	16750	22600
10. deduct increase in dearness allowance etc.	—	1240	2500	3400
11. income at 1960-61 rates	9070	13560	14250	19200

Note : [1]Rough estimate made on the basis of the Report of the Committee of Ministers constituted by the Central Council of Local Self Government, 1963. The figures represent the expenditure financed by own resources of the local bodies as outlays financed by way of grants from States are already part of revenue expenditure of Centre and State ; and [2]Income generated through Government Services formed about 75 percent of the total government expenditure in 1960-61 and about 67 percent in 1964-65. It is assumed that it would be 65 percent in 1965-66 and 1970-71.

Explanatory Notes to National Income Tables

Table NI. 1 gives in a summary form the estimates of national income by broad sectors for the years 1960-61, 1964-65, 1965-66 and 1970-71. These estimates are based on the following sources:

(*a*) For commodity producing sectors *i.e* agriculture and allied activities, minerals, factory establishments, small scale industries including construction, transport and government services, the figures are based on detailed estimates given in Tables NI. 2 to NI. 7. The sources of data and basis of the estimates for these sectors are explained in subsequent paragraphs.

(*b*) Taking the CSO's estimate for 1960-61 as the base, income from communication sector has been worked out by taking the growth in the number of post offices, telegraphs and telephones as the basis. Except for 1965-66 which was an exceptionally bad year, income from commerce is assumed to grow at the same rate as the growth in net output of the commodity producing sectors. For 1965-66, the estimate has been worked out on the basis of the observed trend. Income from organised banking and insurance has been related to growth in bank deposits and life fund.

(*c*) Income from house-property has been related to the investment in housing as deflated by the increase in cost of construction materials and wages. The 1960-61 figure of investment in housing has been obtained from RBI bulletin (February 1963). Incomes from professions, liberal arts and domestic services are taken to grow at the same rate as the growth in all other sectors.

The bases of the estimates given in Tables NI. 2 to NI. 7 are set out below :

Agriculture (Table NI. 2)

Estimates of output : For the year 1960-61 all figures of output are taken from the National Income Unit of the Central Statistical Organisation. Estimates of output for major crops for 1964-65 are taken from Government of India, Ministry of Food and Agriculture, Directorate of Economics and Statistics, *Final Estimates of Principal Crops*.

The estimates of output in 1965-66 as well as targets for 1970-71 in respect of major crops and for major livestock products have mainly been taken from Government of India, Planning Commission, *Fourth Five Year Plan—A Draft Outline*. However for some of the items where the data were not available in the document, estimates given in the following publications have been used:

(1) Government of India, Ministry of Food and Agriculture, *Approach to Agricultural Development in the Fourth Five Year Plan* (mimeographed), March, 1966.

(2) *Reports of the Working Group on Animal Husbandry for the Third and the Fourth Plans.*

Figures for 1965-66 in respect of item numbers 13-14 and 16-17 as given in Table NI. 2·1, are the same as for 1964-65, since no other data are available.

The above sources, however, do not cover a number of minor crops and bye-products. The basis for projections of these items is briefly indicated below :

Tobacco : The figures of output include stalks and stems which are taken at 37 per cent of the output.

Potatoes : Between 1960-61 and 1962-63 production of potatoes increased by 15 per cent, or nearly 7 per cent per year. The estimates of output for 1965-66 and 1970-71 have been based on the assumption that this growth rate would be maintained between 1962-63 and 1970-71.

Other fruits and vegetables : It has been assumed that the output will rise at the rate of about 5 per cent per annum throughout the period.

Other condiments and spices : In the absence of estimates for all items, the total output of this group is assumed to grow at the same rate as the combined value of black pepper, ginger and cardamom. The latter index is computed from estimates of the Ministry of Agriculture.

Fodder : An annual growth rate of 4 per cent and 5 per cent has been assumed for the Third and the Fourth Plans respectively.

Straw : The physical output of straw has been assumed to increase in the same proportion as the increase in the output of foodgrains.

Other agricultural products : An annual increase of 3 per cent has been adopted for the Third Plan and 4 per cent for the Fourth Plan.

Chillies : Index of output for 1970-71 (with base 1960-61=100) as given in *Approach to Agricultural Development in the Fourth Plan* has been applied to 1960-61 estimates. 1965-66 figure has been interpolated.

Rice husk and bran : Assumed to grow at the same rate as the output value of rice.

Non-reporting areas : It is assumed that the output for non-reporting areas will rise at an average annual rate of 2·3 per cent during the Third Plan and 3·0 per cent during the Fourth Plan.

Meat : This is derived on the basis of the index of increase in meat output estimated by the Agriculture Division of the Planning Commission.

Hides and skins : As in the case of meat, the index of output for these items as projected by the Agriculture Division has been applied to the base year figure.

Other animal husbandry products : An average rate of growth of one per cent per year has been assumed for the period.

Fish : Index of production as estimated by the Agriculture Division has been applied to the base year (1960-61) figures.

Forestry : An increase of 20 per cent during the third plan and 25 per cent during the fourth plan periods has been assumed.

Prices

The average unit prices for various commodities in 1960-61 have been obtained from the National Income Unit of the Central Statistical Organisation.

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Calculation of net output

The total value of material inputs and services, which have to be deducted from the gross output in order to obtain the contribution of agriculture to national income, are based on detailed calculations of the value of seed, feed, fertilizers, fuels, electricity and other specific inputs required to achieve the targetted levels of production in various years.

Minerals (Table NI. 3)

Output figures for all major minerals for 1960-61 to 1965-66 have been derived from Monthly Bulletin of Mineral Statistics published by the Indian Bureau of Mines. For 1970-71, the output figures of coal, iron ore and crude oil are taken from Draft Outline. For certain other major minerals, the estimates have been derived by preparing material balances on the basis of demand of consuming industries. For other minerals the estimates have been made on the basis of information available from GSI, IBM and Department of Atomic Minerals.

Price data has been taken from *Indian Mineral Year Book, 1962*, published by the Indian Bureau of Mines.

Organised Industries (Table NI. 4)

Unit prices of output and the ratio of value added to value of output are based on data for 1960-61 as given in *Annual Survey of Industries, 1960*.

The physical outputs for the years 1960-61, 1964-65 and 1965-66 have been taken from the various published sources mentioned in the footnotes to Table NI. 4. For 1970-71 the figures have mainly been taken from the Draft Fourth Plan. Where no targets are given, provisional estimates prepared by various Working Groups have been adopted. The 1975-76 figures are in all cases PPD estimates.

Although much ground has been covered, it has not been possible to obtain physica production data for all individual items in the organised sector. The items for which this information was not available have been grouped as 'others' under each major industrial category. Estimates of value of output and value added of these items are available in the *Annual Survey of Industries, 1960*. For other years, the growth of this category has been assumed to be the same as that observed in the specified industries within each major industrial group.

The total value of output and value added in all major industrial groups in 1960-61 is deducted from the total of all industries as given in the *Annual Survey of Industries, 1960*, the difference furnishing the output and value added in 'miscellaneous industries' for that year. The 'miscellaneous industries' in the other years are assumed to grow at the same rate as observed in the major industrial groups.

The estimates for sample sector industries have been derived from the base year data for 1960 furnished in the *Annual Survey of Industries (Sample Sector)*. For the years 1964-65, 1965-66, 1970-71 and 1975-76 the sample sector in each industrial group has been assumed to grow at the same rate as observed in the corresponding industrial group in the census sector. A depreciation factor of 11·5 per cent, as observed in 1960, has been applied to the gross estimates of the sample sector to arrive at the estimates of net contribution of the sector to value added.

A further adjustment for coverage has been made to take account of the difference between the official National Income Estimates for 1960-61 and the totals given in the *Annual Survey of Industries, 1960*. This difference has been carried over to all other years.

Small Enterprises and Construction (Table NI. 5)

Estimation of income originating in the small industrial enterprises is one of the weakest links in the national income estimates of India. The growth rate of income from this sector revealed by the White Paper is only 2 per cent per annum, which is known to be an underestimate.

In the proposals for revision of national income series[1] the conventional approach of the White Paper for income estimation of this sector is to be replaced by the 'product approach', and the 1955-56 estimates have been projected for other years on the basis of output of relevant commodities. In Table NI·5 also the product approach has been followed, but the indices used to indicate the movement over time are different in some cases. The total for 1960-61 is obtained from the White Paper, and the composition by the industrial groups is assumed to be the same as that for 1959-60 (Revised Series).

It is inevitable that the overall movement of income shown by the conventional method and the product approach will be different. It is necessary to reconcile the rather large difference in the two sets of estimates.

Income of other years is obtained by relating income to the following indices :

(1) 'Textile and tailoring' are assumed to have equal share in income in 1960-61. Income from 'textile' is related to the production of handloom, powerloom and khadi cloth and of 'tailoring' to the output of total textile industry.

(2) 'Leather and leather products' to the index of production of raw hides and skins and tanned hides.

(3) 'Food, drink and tobacco products' to the index of availability of wheat, rice, pulses, sugarcane, edible oils, cotton and tobacco for processing in the decentralised sector.

(4) 'Wood, glass, stone and ceramics, metal manufacturing and engineering products' to the index of gross capital formation at 1960-61 prices.

(5) 'Other industries' to the simple average of the following three indices: (*a*) percentage change in the total income generated in the above mentioned four industrial groups, (*b*) percentage change in the total output of the agriculture sector and (*c*) percentage change in the population.

(6) 'Construction' to the index of gross capital formation at 1960-61 prices.

Transport (Table NI. 6)

The summary table gives income originating from the following sectors of transport : (1) railways, (2) road transport, (3) air transport and (4) other transport. The statistical data underlying the estimates under railways and road transport are shown respectively in Tables NI. 6. 1 and NI. 6. 2.

Railways (Table NI. 6. 1) : Figures relating to the volume of passenger and goods traffic for 1960-61 and 1964-65 are 'actuals' as given in the Reports of the Railway Board. For 1965-66 and 1970-71 the estimates are as prepared by Transport Division and are in line with the Fourth Plan programme of Railways.

The average earnings per tonne-kilometre and per passenger-kilometre actually realised in 1960-61 have been used to estimate the value of railway transport at constant (1960-61) prices.

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[1] *Government of India Central Statistical Organisation, Proposals for a Revised Series of National Income Estimates, 1961.*

Earnings from other miscellaneous items are estimated on the basis of the ratio of receipts under this category to total earnings from goods and passenger traffic in the respective years.

In 1960-61, the net value added by railways represented about 78·4 per cent of gross earnings. The ratio has been assumed to hold good for all years for which estimates have been made.

Motor transport (*Table N1.6.2*) : The volume of goods and passenger traffic in each year has been worked out on the basis of the number of vehicles in service in that year and estimated average volume of traffic carried per vehicle per annum.

Figures relating to number of vehicles in 1960-61 are obtained from the 'Basic Road Statistics of India' published by the Ministry of Transport and average vehicle performance has been worked out on the basis of various survey reports and other publications on motor transport. Figures for 1964-65 have been estimated and those for 1965-66 and 1970-71 have been taken from Draft Outline.

Average rate charged per tonne-kilometre and per passenger-kilometre has been approximately determined for 1960-61 on the basis of rates charged by State Road Transport undertakings, motor transport companies and individual operators. Data on this has been collected from various surveys, articles, publications etc. The rate charged in 1960-61 has been adopted for all the years.

The ratio between net earnings and gross earnings used here is based on the actual ratio in respect of State Road Transport undertakings. No data is available in respect of private undertakings. Hence, ratio concerning State Transport is adopted for all operators.

Earnings of private carrier trucks owned by industrial establishments, project authorities, etc. have been deducted from the total earnings of all trucks as those have been included under the respective heads.

Air transport and other transport : The White Paper on National Income gives income from 'other commerce and transport'. From this, income from 'motor transport' plus 'other commerce' is subtracted and the residual amount taken as income from air and other transport. Figures for income from 'air transport' for other years are worked out on the basis of the volume of traffic carried by air transport. Figures for income from 'other transport' for other years are related to the gross value of output in agriculture.

Government Services (*Table N1.7*)

Income generated through government services is related to the revenue expenditure of public authorities. Figures upto 1965-66 are taken from budgetary data and those for 1970-71 are based on the projections of expenditure made in the Planning Commission. Transfers and subsidies to the private sector have been excluded. In arriving at the estimates at 1960-61 prices all dearness allowances and salary revisions made after 1960-61 have been deducted from the estimates for subsequent years.

Appendix : Section One
Trend Estimates of Production for Major Crops
India : 1965-66 and 1970-71

1. This note presents estimates of output of major crops which could be expected in 1965-66 and 1970-71 if trend rates of growth observed during the previous 15 years were to continue in the future.

2. The Ministry of Food and Agriculture has published indices of area, yield and production for 28 crops for the period 1950-51 to 1964-65[1]. The corresponding absolute figures are also available.

3. The trend rate of growth has been computed by fitting an equation of the following form to the time series:

$$Y = ab^t$$

Where 'Y' stands for output or area or yield; 't' is time measured in years; 'a' and 'b' are constants.

The estimated values of 'a' and 'b' in respect of area, yield and production for the selected crops are set out in Table N I. A. 1. For convenience of reference, index values of area, yield and production for 't' equal to 10 and 20 years are given in Table N I. A. 2.

4. Given the value of 'a' and 'b', the expected values of the index of area, yield and production in 1960-61, 1965-66 and 1970-71 have been estimated. The actual values for 1960-61 are available both in absolute terms and in terms of index. This is used to convert the expected values of the various indices into absolute terms. The expected values of area, yield and production for the selected crops are shown in Tables N I. A. 3, N I. A. 4 and N I. A. 5. The product of the expected value of area and of per acre yield is used to estimate production[2]. The estimates are summarised below :

Trend Values of Output of Selected Crops
India : 1965-66 and 1970-71

crop[3]	1965-66	1970-71	1970-71 (target)	rate of growth: Fourth Plan	
				trend	target
(1)	(2)	(3)	(4)	(5)	(6)
1. foodgrains	90·5	106·2	120·0	3·25	5·8
2. oilseeds	8·3	9·7	10·7	3·2	5·2
3. cotton	6·2	7·3	8·6	3·3	6·8
4. jute	6·0	7·1	9·0	3·4	8·5
5. sugarcane[4]	12·1	15·2	13·5	4·7	2·2

5. On the above estimates a 90 million tonne output of foodgrains could be expected in 1965-66 on the basis of past trends. An independent calculation by the Ministry of Food and Agriculture also shows that, under normal weather conditions, it would have been possible to get 90 million tonnes of foodgrains with the input supplies available in 1965-66.

6. It is clear that the past trend in output growth has to be appreciably improved upon in order to reach the projected targets for the Fourth Plan. If output grows no faster than during the last 15 years, the actual ouput in 1970-71 (assuming normal weather conditions) will be below target in all cases except sugarcane, whose output in 1970-71 on the basis of past trend will be higher than the target.

Note: [1]See Government of India, Ministry of Food and Agriculture, *Growth Rates in Indian Agriculture* (mimeographed), March 1966 ; [2]For details see Table N I.A. 6 ; and [3] All figures except those relating to jute and cotton in million tonnes; jute and cotton ouput in million bales; and [4] sugarcane figures in terms of gur.

Table N I. A. 1 : Log Values of a and b in the Equation, $y=ab^t$

crop	area		production		yield	
	a	b	a	b	a	b
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. rice	1·9823	0·0058	1·9672	0·0097	1·9495	0·0155
2. wheat	1·9976	0·0116	2·0017	0·0053	1·9993	0·0169
3. all cereals	2·0054	0·0052	1·9617	0·0091	1·9672	0·0142
4. pulses	1·9841	0·0084	2·0129	(—)0·0013	1·9969	0·0071
5. oilseeds	2·0206	0·0105	1·9455	0·0040	1·9661	0·0144
6. cotton	2·1177	0·0078	1·9540	0·0095	2·0717	0·0173
7. jute	2·0902	0·0109	1·9425	0·0035	2·0328	0·0144
8. tea	1·9932	0·0024	2·0102	0·0062	2·0037	0·0085
9. coffee	1·9823	0·0097	2·0446	0·0250	2·0269	0·0348
10. rubber	1·8829	0·0389	2·0606	(—)0·0089	1·9434	0·0300
11. sugarcane	2·0260	0·0134	1·9549	0·0066	1·9810	0·0199
12. tobacco	1·9784	0·0081	1·9507	0·0050	1·9293	0·0131

Note : Time series data is fitted to the equation $y=ab^t$ where y stands for area (col 2, 3), production (col. 4, 5) and yield (col 6, 7). Source of time series data: Government of India, Ministry of Food and Agriculture *Growth Rate of Indian Agriculture*, March 1966.

Table NI.A.2 : Index Number of Trend Values of Area, Production and Yield for $t=10$ and 20 years

crop	area		production		yield	
	t=10	t=20	t=10	t=20	t=10	t=20
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. rice	109·73	125·40	127·20	181·76	115·93	144·95
2. wheat	129·90	169·66	147·59	217·42	113·44	128·15
3. all cereals	114·14	128·65	128·59	178·32	112·90	139·22
4. pulses	116·98	141·94	116·93	137·69	99·98	97·03
5. oilseeds	133·54	170·06	128·86	179·52	96·72	106·05
6. cotton	156·93	187·80	175·67	261·64	111·95	139·32
7. jute	158·20	203·33	150·25	209·32	94·95	102·92
8. tea	104·04	109·96	122·66	149·18	118·09	136·21
9. coffee	120·04	150·08	237·03	528·33	197·06	350·43
10. rubber	187·03	458·04	175·15	349·47	93·67	76·31
11. sugarcane	144·55	196·80	151·36	239·34	104·93	122·15
12. tobacco	114·66	138·17	114·90	155·35	100·16	112·39

Table NI.A.3 : Trend Values of Production of Certain Crops India : 1960-61, 1965-66 and 1970-71

crop	indices (1949-50=100)			production[1]		
	1960-61	1965-66	1970-71	1960-61	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. rice	131·8	157·6	188·4	33092	39570	47303
2. wheat	153·2	186·2	226·3	10349	12578	15287
3. all cereals	132·9	156·7	184·6	66608	78536	92520
4. pulses	118·9	128·8	139·7	11709	12684	13758
5. all foodgrains				78317	91220	106278
6. oilseeds	133·2	157·4	185·9	6940	8201	9685
7. cotton	182·8	223·0	272·2	4788	5840	7129
8. jute	155·3	183·2	216·2	5123	6044	7132
9. tea	125·1	138·2	152·5	332	367	405
10. coffee	256·9	383·0	571·5	45	67	100
11. rubber	187·7	264·8	374·0	28	40	56
12. sugarcane	158·5	199·4	250·8	9602	12080	15194
13. tobacco	118·4	137·6	160·0	318	370	430

Note : [1]In thousand tonnes, except cotton and jute which are in thousand bales (182 Kgs per bale).

Table NI.A.4 : Trend Values of Area under Crops India : 1960-61, 1965-66 and 1970-71

crop	indices (1949-50=100)			area (thousand hectares)		
	1960-61	1965-66	1970-71	1960-61	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. rice	111·2	118·9	127·1	34067	36425	38937
2. wheat	133·4	152·5	174·3	13015	14878	17005
3. all cereals	115·5	121·9	130·2	91072	96118	102663
4. pulses	119·3	131·4	144·7	23754	26163	28811
5. all foodgrains				114820	122281	131474
6. oilseeds	136·8	154·4	174·2	13852	15635	17639
7. cotton	159·8	174·8	191·2	7874	8612	9420
8. jute	162·2	183·9	208·5	764	866	982
9. tea	104·6	107·6	110·6	328	337	346
10. coffee	122·7	137·3	153·5	110	124	138
11. rubber	204·6	320·1	501·0	121	190	298
12. sugarcane	149·1	174·0	203·0	2200	2567	2994
13 tobacco	116·8	128·2	140·8	406	445	489

Table NI.A.5 : Trend Values of Productivity of Certain Crops India : 1960-61, 1965-66 and 1970-71

crop	indices (1949-50=100)			productivity (quintals per hectare)		
	1960-61	1965-66	1970-71	1960-61	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. rice	118·6	132·6	148·3	9·7	10·8	12·1
2. wheat	114·8	122·1	129·8	7·9	8·4	9·0
3. all cereals	115·3	127·9	142·1	7·3	8·1	9·0
4. pulses	99·7	98·0	96·5	4·9	4·8	4·8
5. oilseeds	97·5	102·1	106·8	5·0	5·3	5·5
6. cotton (lint)	114·4	127·7	142·5	1·1	1·3	1·4
7. jute	95·7	99·7	103·8	12·0	12·5	13·0
8. tea	119·8	128·5	138·0	10·2	10·9	11·7
9. coffee	208·7	278·6	371·6	4·1	5·5	7·3
10. rubber	91·8	82·7	74·6	2·3	2·0	1·8
11. sugarcane (gur)	106·5	114·8	123·8	43·7	47·1	50·8
12. tobacco	101·3	107·2	113·5	7·9	8·3	8·8

Table NI.A.6 : Trend Values of Production of Certain Crops India : 1960-61, 1965-66 and 1970-71

crop	unit	1960-61	1965-66	1970-71
(1)	(2)	(3)	(4)	(5)
1. rice	thou. tonnes	33045	39339	47114
2. wheat	thou. tonnes	10282	12498	15305
3. all cereals	thou. tonnes	66483	77856	92397
4. pulses	thou. tonnes	11639	12558	13829
5. oilseeds	thou. tonnes	6926	8287	9701
6. cotton	thou. bales	4812	6220	7327
7. jute	thou. bales	5093	6014	7092
8. tea	thou. tonnes	335	367	405
9. coffee	thou. tonnes	45	68	101
10. rubber	thou. tonnes	28	38	54
11. sugarcane	thou. tonnes	9614	12091	15210
12. tobacco	thou. tonnes	321	369	430

Note: Estimated on the basis of Tables NI.A.4 and NI. A.5.

SECTION TWO

Material Balances

Balances for Agricultural Commodities, India : 1964-65, 1970-71 and 1975-76

Material Balances

Introductory Note

Balances for 31 Selected Minerals, Manufactures and Electricity

Section Two

Balances for Agricultural Commodities, India : 1964-65, 1970-71 and 1975-76

1. Estimates, derived from the Input-Output exercise of the requirements of major agricultural commodities by categories of end-use for 1964-65, 1970-71 and 1975-76 are summarised in the accompanying set of tables.

2. The future requirements of household consumption of foodgrains, edible oils, sugar and gur, tobacco products and cotton textiles are estimated on the basis of demand elasticities. The details of these calculations are set out in another note[1]. The export levels for 1970-71 are taken from the tentative export targets for the Fourth Plan. Figures for 1975-76 are provisional estimates of the Perspective Planning Division. The requirements for various intermediate uses are derived from the Input-Output model. Imports of foodgrains and processed agricultural products except edible oils are assumed to be negligible in 1970-71 and 1975-76.

3. Detailed balances for foodgrains, oil seeds, sugarcane, cotton and tobacco are given in Tables MB. A. 1 to MB. A. 9. They indicate the quantum of these primary agricultural products entering directly into human consumption, the absorption by processing industries, other non-industrial intermediate uses, exports and accumulation of inventories. The last item is taken to be approximately one-fourth of the addition to output in the particular year. Imports are deducted from the total requirements to obtain domestic output. Supplementary tables showing the balances for processed products are also presented along with balances for primary commodities. For example Table MB.A. 6 is for raw cotton while Table MB. A. 7 is for cotton yarn and Table MB. A. 8 for cloth.

4. The level of domestic production for 1970-71 as obtained from the Input-Output model and the corresponding targets as set out in the Draft Fourth Plan are summarised below :

	unit	Production Targets for 1970-71	
		Input-Output model	Draft Plan
(1)	(2)	(3)	(4)
1. foodgrains	million tonnes	116·2	120
2. oil seeds	million tonnes	10·6	10·7
3. sugarcane (gur)	million tonnes	15·7	13·5
4. cotton	million bales	8·7	8·6
5. tobacco	thou. tonnes	521	475

Note :[1] See Section Six, Appendix 2.

Table MB.A.1 : Balance for Foodgrains
India : 1964-65, 1970-71 and 1975-76

(million tonnes)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. final consumption	83·5	102·8	129·1	130·2
2. seed, feed and wastage	9·9	12·0	20·2	21·3
3. stocks	1·3	1·4	2·5	2·6
4. exports	—	—	—	—
5. total requirements	*94·7*	*116·2*	*151·8*	*154·1*
6. imports	6·3	—	—	—
7. domestic production	88·4	116·2	151·8	154·1

PPD/Sept. 1966.

Table MB.A.2 : Balance for Oil Seeds
India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-61 factor cost)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. household consumption intermediate uses	1020	1299	1730	1744
2. vegetable oils	4901	6355	9551	9607
3. seed	508	620	950	957
4. exports	19	—	—	—
5. stocks	242	65	272	276
6. total requirements	*6690*	*8339*	*12503*	*12584*
7. imports	70	110	127	123
8. domestic production	6620	8229	12376	12461
9. domestic production of major oil seeds (thou. tonnes)	8474	10550	15840	15950

PPD/Sept 1966.

Table MB.A.3 : Balance for Vegetable Oils
India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-61 factor cost)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. final consumption intermediate uses	3323	4240	5713	5760
2. vanaspati	772	1252	2305	2339
3. paint and varnishes	34	77	122	134
4. soap and cosmetics	291	464	697	704
5. miscellaneous	304	343	482	482
6. exports	363	582	1013	963
7. stocks	262	102	313	317
8. total requirements	*5349*	*7060*	*10645*	*10699*
9. import	49	60	88	88
10. domestic production	5300	7000	10557	10611

PPD/Sept. 1966.

Table MB. A.4 : Balance for Sugarcane
India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-61 factor cost)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. household consumption	188	245	338	341
2. manufacture of sugar	1372	2078	2895	2909
3. manufacture of gur	3032	3511	5174	5215
4. seeds	293	377	550	554
5. stocks	—	70	214	218
6. domestic production	*4885*	*6280*	*9172*	*9238*
7. domestic production (million tonnes of cane)	122·1	157·0	229·3	230·9

Note : Differences in totals are due to rounding.
PPD/Sept. 1966.

Table MB.A.5 : Balance for Sugar and Gur
India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-61 factor cost)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. final consumption	5107	6736	9565	9650
2. soft drinks and confectionary	77	106	134	136
3. others	20	32	52	52
4. exports	219	460	638	617
5. stocks	227	88	250	253
6. total requirements	*5650*	*7422*	*10638*	*10707*

Note : Differences in totals are due to rounding.
PPD/Sept. 1966.

Table MB.A.6 : Balance for Raw Cotton
India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-61 factor cost)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. yarn manufacture	2727	3421	4785	4811
2. miscellaneous industrial uses	19	37	70	73
3. household consumption	80	102	137	138
4. exports	106	165	200	191
5. stocks	(—) 140[1]	83	180	182
6. total requirements	*2792*	*3808*	*5372*	*5395*
7. imports	581	262	359	366
8. domestic production	2211	3546	5013	5029
9. domestic production (thousand bales)	5407	8673	12258	12296

Note : [1]Includes Rs. 126 million which is in the nature of a statistical discrepancy.
PPD/Sept. 1966.

Table MB.A.7 : Balance for Cotton Yarn
India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-61 factor cost)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. textile manufacture	5277	6700	9220	9277
2. other textiles and miscellaneous industrial uses	145	195	298	301
3. exports	93	191	277	268
4. stocks	196	72	215	218
5. total requirements (=domestic production)	*5711*	*7158*	*10010*	*10064*

PPD/Sept. 1966.

Table MB.A.8 : Balance for Cotton Cloth
India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-61 factor cost)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. final consumption	7508	9597	12937	13057
2. intermediate uses	244	350	545	549
3. exports	585	675	977	941
4. stocks	121	114	316	320
5. total requirements (=domestic production)	*8458*	*10736*	*14775*	*14867*

PPD/Sept. 1966.

Table MB.A.9 : Balance for Raw Tobacco
India : 1964-65, 1970-71 and 1975-76

(thousand tonnes)

	1964-65	1970-71	1975-76	
			I	II
(1)	(2)	(3)	(4)	(5)
1. manufacture of tobacco products	281·3	361·3	491·7	496·1
2. household consumption	12·1	18·3	25·0	25·1
3. exports	78·1	133·9	133·9	133·9
4. stocks	—	7·6	14·7	15·2
5. total requirements	*371·5*	*521·1*	*665·3*	*670·3*
6. imports	1·8	—	—	—
7. domestic production	369·7	521·1	665·3	670·3

PPD/Sept. 1966.

Material Balances

1. In a balanced plan of economic development, it is necessary to ensure that supplies of various raw materials, intermediate goods and services which enter into the processes of production are available in requisite quantity and quality and in time to meet the demand of using industries. This is particularly important in a developing economy which has to push ahead in the face of chronic shortage of foreign exchange. The tight balance of payments position does not permit large unplanned diversion of limited foreign exchange to any sector without causing serious imbalances and bottlenecks in other sectors. Moreover, the remedy of making corrections by resorting to imports is not available in regard to inputs like electricity and service such as internal transport.

2. Ideally it is only within the framework of an input-output matrix that one can assess fully all the factors which determine the demand for an industry's product. The demand includes (*a*) the intermediate demands from other industries ; (*b*) the whole set of final demands from consumers, for government consumption and for investment in the public and private sectors, which depend on macro-economic decisions of the plan; and (*c*) the industry's foreign trade, subject to the assumptions of exports and imports implied in the plan strategy.

3. But, as elsewhere, it is difficult to translate the ideal into practice. The requirements of data and the difficulties of analysis greatly increase the larger the number of sectors included in an Input-Output Table. The Input-Output Table for the Indian economy prepared in the Perspective Planning Division (in close collaboration with the Planning Unit of the Indian Statistical Institute at New Delhi) recognises only 77 sectors, although it is by far the biggest such Table ever attempted for the Indian economy. This Input-Output Table has the notable feature that it is a composite of four separate tables each describing the inter-industrial flows and the pattern of final demand in the base year 1964-65, for the year 1970-71 (as closely corresponding to the Draft Fourth Five Year Plan formulations) and for the year 1975-76, in two alternatives (seeking to bring out the implications of the perspective of development based on self-reliance, as broadly indicated in Chapter Two of the Draft Fourth Five Year Plan)[1]. Each cell in the Table and the corresponding Chart showing the structure of the Indian economy, has at its four corners four separate figures, representing the situation in the base year, and in the terminal years of the Fourth and the Fifth Plans. This presentation brings out vividly the features of dynamic change in the economy.

4. The Table also establishes the balance and consistency of the Plan at the aggregative level of the sector classification adopted in it. But the balance of supply and demand which is directly useful for operational purposes, both for determination of the target of production and creation of new capacity and for allocation of foreign exchange is required to be at the level of specific products of significance. It is possible and useful to examine this problem in detail for selected key commodities and services by way of partial analysis within the overall macro-economic framework, by using the method of Material Balances.

5. Essentially, in this method the demand of a specific commodity, mainly used as intermediate product is arrived at by the application of end-use analysis. The successive stages are: (*a*) identification of major consuming sectors and their sub-sectors, their current production and targets of production for the Fourth Plan; (*b*) determination of input 'norms'

Note: [1]For a detailed account see Section Six : *Structure of Indian Economy, Inter Industrial Flows and Pattern of Final demand : India* : 1964-65, 1970-71 and 1975-76 (Notes, Tables and Charts).

in the past on the basis of observed data and adapting it for future in the light of relevant technical information; (*c*) calculation of material requirements from the targets of production of using sector and the input 'norms'; and (*d*) estimation of addition to stocks and other uses. A number of such Material Balances have been prepared in connection with the formulation of the Draft Fourth Five Year Plan.

6. Considered along with the macro-economic assumptions of the Plan[1] and its broad inter-industrial balance[2], these material balances provide the rationale for fixing output targets of principal commodities in the Plan and give evidence of the balance and consistency of the Plan. The effort required for the preparation of material balances contributes also to the better understanding of the structure of the economy and to the identification and improvement of the data needed for planning. The inter sectoral relations revealed at this level of disaggregation also help in improving the technological coefficients used in Input-Output Tables. These practical advantages are already being progressively realised in India as the planning process gets more complex and tools used more sophisticated.

7. Without entering into a detailed discussion of the sources of data and technical issues relating to 'norms' at this stage, the Material Balances for the following items are reproduced in the form of tables showing the pattern of demand and the arrangements for supply for the base year, and the terminal years of the Fourth and the Fifth Plans. Brief explanatory notes have been added to the Tables.

item	table no.	item	table no.
Coal	MB.1	Sulphur	MB.18
Petroleum products	MB.2	Sulphuric acid	MB.19
Electricity	MB.3	Caustic soda	MB.20
Iron ore	MB.4	Soda ash	MB.21
Lime-stone	MB.5	Chlorine	MB.22
Bauxite	MB.6	Mercury	MB.23
Chromite	MB.7	Benzene	MB.24
Manganese ore	MB.8	Carbon black	MB.25
Cement	MB.9	Phthalic anhydride	MB.26
Asbestos	MB.10	Rubber	MB.27
Mild steel	MB.11	Chemical pulp	MB.28
Special steels	MB.12	Motors	MB.29
Aluminium	MB.13	Transformers	MB.30
Copper	MB.14	Ball bearings	MB.31
Lead	MB.15		
Zinc	MB.16		
Tin	MB.17		

Note : [1]See *Section Six* : *Appendix* 1 : *Basis for Projections of Gross Domestic Expenditure and its Disposition; and* [2]See Section Six : *Structure of Indian Economy.*

Table MB. 1 : Material Balance : Coal
India : 1965-66, 1970-71 and 1975-76

consuming sector	production of consuming sectors				consumption norms tonnes / unit		requirement of coke (thousand tonnes)		
	unit	1965-66	1970-71	1975-76	coke	non-coking coal	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. railways							—	32	35
2. port and dock railways							—	4	5
3. pig iron	thou. tonnes	7100	12700	23000			5780	10760	18400
4. electricity-thermal	mil. kwh	17200	40000	72000		600	—	—	—
5. cement	thou. tonnes	10800	20000	30000	0·5	340	—	10	15
6. paper and paper board	thou. tonnes	560	900	1700	5	240	—	5	9
7. newsprint	thou. tonnes	30	150	250		225	—	—	—
8. cotton textiles (mill)	mil. metres	4400	5500	7000	3	360	—	16	21
9. jute	thou. tonnes	1302	1700	2000	2	300	—	3	4
10. glass	thou. tonnes	280	500	750	40	1300	—	20	30
11. refractory	thou. tonnes	703	1500	2500		450	—	—	—
12. sugar	thou. tonnes	3402	4500	6800	14	75	48	63	95
13. vanaspati	thou. tonnes	426	695	1060	18	300	—	12	19
14. ceramics and potteries	thou. tonnes	n.a.	425	650		1500	—	74	114
15. soda ash	thou. tonnes	331	600	900	265		88	159	240
16. calcium carbide	thou. tonnes	50	60	80	750		37	45	60
17. chemicals	index	—					—	—	—
18. rerolling mills	thou. tonnes		1200	2000	4		—	5	8
19. engineering works	index						300	550	1020
20. ferro-manganese	thou. tonnes	150	300	400	750		117	225	300
21. brick burning	index						—	—	—
22. lime kilns	index						—	—	—
23. steamer service	index						—	—	—
24. fertilisers (N_2)	thou. tonnes	234	2000	4000		index	130	130	130
25. tea gardens	index						—	—	—
26. starch factories	index						—	—	—
27. ginning and pressing	index						—	—	—
28. soft coke	index						—	—	—
29. bunker	index						—	—	—
30. foundry (in terms of pig iron)	thous tonnes	1200	3000	5000	500		600	1500	2500
31. miscellaneous (including defence)	index						200	400	500
32. total requirement							7300	14013	23505

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Table MB. 1 : Material Balance : Coal—*contd.*
India : 1965-66, 1970-71 and 1975-76—*contd.*

consuming sector	requirement of non-coking coal (thousand tonnes)											
	1965-66				1970-71				1975-76			
	steam	slack	middling	total	steam	slack	middling	total	steam	slack	middling	total
(1)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1. railways	17200	—	—	17200	16000	—	—	16000	13000	—	—	13000
2. port and dock railways	140	—	—	140	150	—	—	150	170	—	—	170
3. pig iron	—	—	—	—	—	—	—	—	—	—	—	—
4. electricity—thermal	3400	4000	1900	9300	6900	10000	6400	23300	11370	17000	4830	43200
5. cement	—	2950	—	2950	—	6380	—	6380	—	10100	—	10100
6. paper and paper board	1000	350	—	1350	1500	660	—	2160	3080	1000	—	4080
7. newsprint	50	20	—	70	240	100	—	340	360	200	—	560
8. cotton textiles (mill)	1580	—	—	1580	1980	—	—	1980	2520	—	—	2520
9. jute	390	—	—	390	510	—	—	510	600	—	—	600
10. glass	370	—	—	370	650	—	—	650	970	—	—	970
11. refractory	320	—	—	320	670	—	—	670	1120	—	—	1120
12. sugar	260	—	—	260	340	—	—	340	510	—	—	510
13. vanaspati	130	—	—	130	210	—	—	210	320	—	—	320
14. ceramics and potteries	500	—	—	500	640	—	—	640	970	—	—	970
15. soda ash	—	—	—	—	—	—	—	—	—	—	—	—
16. calcium carbide	—	—	—	—	—	—	—	—	—	—	—	—
17. chemicals	2000	400	—	2400	4000	500	—	4500	6000	1000	—	7000
18. rerolling mills	—	—	—	—	—	—	—	—	—	—	—	—
19. engineering works	100	—	—	100	420	—	—	420	670	—	—	670
20. ferro-manganese	—	—	—	—	—	—	—	—	—	—	—	—
21. brick burning	—	3500	—	3500	—	4000	1500	5500	—	6400	2350	8750
22. lime kilns	400	—	—	400	550	—	—	550	870	—	—	870
23. steamer service	190	—	—	190	300	—	—	300	450	—	—	450
24. fertilisers (N_2)	450	—	—	450	2020	—	—	2020	3800	—	—	3800
25. tea gardens	200	—	—	200	250	—	—	250	300	—	—	300
26. starch factories	50	—	—	50	80	—	—	80	100	—	—	100
27. ginning and pressing	150	—	—	150	220	—	—	220	280	—	—	280
28. soft coke	5500	—	—	5500	5000	—	2900	7900	7000	—	3000	10000
29. bunker	40	—	—	40	100	—	—	100	150	—	—	150
30. foundry (in terms of pig iron)	—	—	—	—	—	—	—	—	—	—	—	—
31. miscellaneous (including defence)	1200	1310	—	2510	2000	1380	1000	4380	2500	1950	2000	6450
32. total requirement	35620	12530	1900	50050	44730	23020	11800	79550	57110	37650	22180	116940

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Table MB. 1 (*a*) : Supply and Demand of Coal
India : 1965-66, 1970-71 and 1975-76

(thousand tonnes)

(1)	1965-66 (2)	1970-71 (3)	1975-76 (4)
coke			
1. total requirement	7300	14013	23505
2. indigenous production	7300	14190	23505
3. imports (plus)	—	—	—
4. exports (minus)	—	—	—
5. addition to stocks	—	177	—
6. total availability	7300	14190	23505
coking plus blendable coal			
7. total requirement	19000	35547	59700
8. indigenous production	19000	36000	59700
9. imports (plus)	—	—	—
10. exports(inus)	—	—	—
11. addition to stocks	—	453	—
12. total availability	19000	36000	59700
non coking coal			
13. total requirement	48150	67750	94760
14. indigenous production	49000	70000	98300
15. imports (plus)	—	—	—
16. exports (minus)	800	1900	3000
17. addition to stocks	50	350	540
18. total availability	48200	68100	95300
19. total production (8+14)	68000	106000	158000

PPD/Sept. 1966.
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Table MB. 2 : Material Balance ; Petroleum Products
India : 1964-65, 1970-71 and 1975-76

(thousand tonnes)

	1964		1965			1970-71			1975-76	
	consumption	production	consumption	production	demand	production	imports	demand	production	imports
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. gasoline	1125	1380	1270	1606	3930	3860	70	7300		
2. motor spirit	1009	1380	1153		1600			2530		
3. aviation gasoline	24		87		70		70	70		
4. naphtha for fertilisers	32		30		1610			3700		
5. naphtha for petro chemicals					650			1000		
6. high speed diesel	2033	1460	2326	1791	4250	4390		7510		
7. railways	256				705			1410		
8. motor transport	1777				3545			6100		
9. others (defence etc.)										
10. kerosene	2978	1609	2925	1540	4200	3840	360	6200		
11. domestic use	2608		2498		3350			4500		
12. aviation turbine fuel	370		427		850			1700		
13. light diesel oil	595	602	725	783	925	925		1180		
14. furnace oil	3013	2404	3098	2581	5600	5260	340	8600		
industries, power, etc.										
international bunkers										
15. lubricants	400	38	358	46	730	730		1400		
16. bitumen	506	467	588	551	840	840		1150		
17. refinery boiler fuel			305		700	700		1140		
18. others		437	478	534	850	850		1370		
19. total products	10650	8397	12073	9432	22025	21395	770	35850	35100	
20. refinery losses		474		568		1305			2200	
21. crude run		8871		10000		22700			37300	
22. indigenous production						9800			12500	
23. imports						12900			24800	

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Table MB. 3 : Material Balance : Electricity
India : 1964-65, 1965-66, 1970-71 and 1975-76

(million kwhrs)

	actual production		production target	
	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)
1. major industrial consumption[1]	16269	17520	42363	68575
2. other industrial consumption	4450	4917	7917	12752
3. total industrial consumption	20719 (75)	22437 (75)	50280 (76)	81327 (76)
4. domestic consumption	2486 (9)	2704 (9)	5292 (8)	8560 (8)
5. commercial consumption	1381 (5)	1503 (5)	3308 (5)	5350 (5)
6. irrigation consumption	1657 (6)	1802 (6)	3969 (6)	6421 (6)
7. other purposes consumption	1381 (5)	1503 (5)	3308 (5)	5350 (5)
8. total consumption[2]	27624 (100)	29949 (100)	66157 (100)	107008 (100)
9. assumed losses	4972 (18)	5391 (18)	11908 (18)	19261 (18)
10. total generation	32596	35340	78065	126269
11. installed generating capacity (million kw)	8·75	9·82	19·51	31·57
12. kwhrs per kw	3725	3600	4000	4000

Note : Figures in brackets are percentage to total consumption; [1]For details, see Table MB. 3 (a); and [2]This includes electricity consumed by self generating industrial units estimated to remain constant at 4500 million kwh.

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Table MB. 3 (*a*) : Material Balance : Electricity : Major Industrial Consumption
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry	unit	actual production		production target		requirement of electricity (million kwhrs)				'norms' rate of consumption
		1964-65	1965-66	1970-71	1975-76	1964-65	1965-66	1970-71	1975-76	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. bauxite	thou. tonnes	639·0	680·0	2600·0	3650·0	15·33	16·32	62·40	87·60	24 kwhrs/tonne
2. copper ore mining	thou. tonnes	473·0	465·0	3500·0	7000·0	11·35	11·16	84·00	168·00	24 kwhrs/tonne
3. coal	mil. tonnes	64·4	68·0	106·0	158·0	966·00	1020·00	1590·00	2370·00	15 kwhrs/tonne
4. coal washing	mil. tonnes	7·7	8·7	34·0	56·7	38·50	43·00	170·00	283·50	5 kwhrs/tonne
5. coke	mil. tonnes	7·0	7·3	14·2	23·5	182·00	189·80	369·20	611·00	26 kwhrs/tonne
6. iron ore mining	thou. tonnes	14880·0	24500·0	54000·0	85000·0	223·20	367·50	810·00	1275·00	15 kwhrs/tonne
7. manganese ore mining	thou. tonnes	1236·0	1562·0	3200·0	4000·0	18·54	23·43	48·00	60·00	15 kwhrs/tonne
8. petroleum crude	thou. tonnes	2290·0	3500·0	9500·0	15000·0	45·80	70·00	190·00	300·00	20 kwhrs/tonne
9. pig iron for sale	mil. tonnes	1·0	1·2	3·0	5·2	20·00	24·00	60·00	104·00	20 kwhrs/tonne
10. ferro-alloys	thou. tonnes	—	5·0	10·0	25·0	—	25·00	50·00	125·00	5000 kwhrs/tonne
11. ferro-silicon	thou. tonnes	18·0	20·0	55·0	100·0	180·00	200·00	550·00	1000·00	10000 kwhrs/tonne
12. ferro-manganese	thou. tonnes	130·0	150·0	300·0	400·0	650·00	750·00	1500·00	2000·00	5000 kwhrs/tonne
13. ferro-chrome	thou. tonnes	—	—	40·0	60·0	—	—	340·00	510·00	8500 kwhrs/tonne
14. finished steel	mil. tonnes	4·4	4·4	8·8	15·5	2200·00	2200·00	4400·00	7750·00	500 kwhrs/tonne
15. alloy steel	thou. tonnes	—	35·0	300·0	600·0	—	43·75	375·00	750·00	1250 kwhrs/tonne
16. electrical steel	thou. tonnes	23·5	24·0	32·0	100·0	19·15	19·56	26·60	82·00	815 kwhrs/tonne
17. aluminium refining	thou. tonnes	54·1	61·3	330·0	450·0	1082·00	1226·00	6600·00	900·00	20000 kwhrs/tonne
18. copper smelting	thou. tonnes	9·4	9·4	37·5	70·0	28·20	28·20	112·50	210·00	3000 kwhrs/tonne
19. zinc smelting	thou. tonnes	—	4·2	70·0	100·0	—	17·64	294·00	420·00	4200 kwhrs/tonne
20. manganese (elec. process)	thou. tonnes	—	8·0	16·0	30·0	—	90·00	180·00	337·00	11240 kwhrs/tonne
21. magnesium	thou. tonnes	—	—	2·0	5·0	—	—	35·00	88·00	17640 kwhrs/tonne
22. titanium	thou. tonnes	—	—	—	5·0	—	—	—	221·00	44140 kwhrs/tonne
23. flour milling	thou. tonnes	1671·0	2075·0	2500·0	3000·0	66·84	83·00	100·00	120·00	40 kwhrs/tonne
24. sugar	mil. tonnes	3·2	3·4	4·5	6·8	448·00	476·00	630·00	952·00	140 kwhrs/tonne
25. ethyl alcohol	thou. k. litres	160·0	183·0	250·0	280·0	3·84	4·39	6·00	6·70	24 kwhrs/thou. k. litres

	textiles									
26.	cotton textiles	mil. metres	4676·0	4400·0	5486·0	7000·0	2043·00	1922·80	2397·38	3059·00	437 kwhrs/thou. metres
27.	jute textiles	thou. tonnes	1292·0	1302·0	1700·0	2000·0	581·40	585·90	765·00	900·00	450 kwhrs/tonne
28.	silk textiles (mill made)	mil. metres	420·0	450·0	657·0	1100·0	138·60	148·50	217·00	363·00	330 kwhrs/thou. metres
29.	woollen yarn	thou. tonnes	14·0	13·6	20·4	32·0	92·61	89·20	135·00	212·00	6615 kwhrs/tonne
30.	paper and paper board	thou. tonnes	495·0	560·0	900·0	1700·0	594·00	672·00	1080·00	2040·00	1200 kwhrs/tonne
31.	newsprint	thou. tonnes	30·0	30·0	150·0	300·0	63·63	63·63	318·15	636·30	2121 kwhrs/tonne
32.	automobile tyres	thou. tonnes	2150·0	2308·0	6000·0	11000·0	230·05	246·96	642·00	1177·00	107 kwhrs/no.
33.	acetic acid	thou. tonnes	7·0	8·0	22·0	50·0	3·15	3·60	9·90	22·50	450 kwhrs/tonne
34.	calcium carbide	thou. tonnes	44·3	50·0	60·0	80·0	155·00	175·00	210·00	280·00	3500 kwhrs/tonne
	caustic soda										
35.	chemical process	thou. tonnes	19·0	20·0	50·0	80·0	9·50	10·00	25·00	40·00	500 kwhrs/tonne
36.	electrolytic process	thou. tonnes	173·0	197·0	450·0	720·0	726·60	827·40	1890·00	3024·00	4200 kwhrs/tonne
37.	hydrogen peroxide	thou. tonnes	4·5	4·5	6·3	10·0	25·60	25·60	35·90	57·00	5700 kwhrs/tonne
38.	soda ash	thou. tonnes	286·0	331·0	600·0	900·0	37·18	43·03	78·00	117·00	130 kwhrs/tonne
39.	sodium bicarbonate	thou. tonnes	11·0	13·0	20·0	50·0	5·30	6·30	9·70	24·25	485 kwhrs/tonne
40.	nitric acid	thou. tonnes	12·8	16·0	60·0	100·0	2·56	3·20	12·00	20·00	200 kwhrs/tonne
41.	phosphoric acid	thou. tonnes	2·4	2·6	8·0	12·0	9·93	10·76	33·12	49·68	4140 kwhrs tonne
42.	sulphuric acid	thou. tonnes	695·0	67·0	2400·0	4500·0	48·65	45·71	168·00	315·00	70 kwhrs/tonne
43.	zinc oxide	thou. tonnes	9·5	9·3	30·0	50·0	3·40	3·35	10·80	18·00	360 kwhrs/tonne
44.	plastics	thou. tonnes	35·0	·0	200·0	400·0	2··0	2·40	12·00	24·00	60 kwhrs/tonne
45.	synthetic rubber	thou. tonnes	12·0	14·0	30·0	90·0	8·40	9·80	21·00	63·00	700 kwhrs/tonne
46.	rayon filament	thou. tonnes	35·0	38·0	67·0	70·0	238·00	258·40	455·60	476·00	6800 kwhrs/tonne
47.	staple fibre	thou. tonnes	37·0	38·0	35·0	90·0	67·34	69·16	63·70	163·80	1820 kwhrs/tonne
48.	nylon yarn	thou. tonnes	1·2	1·3	3·0	15·0	8·00	8·67	20·00	100·00	6670 kwhrs/tonne
49.	chemical pulp	thou. tonnes	—	48·0	110·0	200·0	—	48·00	110·00	200·00	1000 kwhrs/tonne
50.	dyestuffs	thou. tonnes	4·5	4·5	14·0	20·0	9·00	9·00	28·00	40·00	2000 kwhrs/tonne
51.	acetylene gas	mil. cu. metres	4·5	5·2	14·0	20·0	0·70	0·81	2·17	3·10	155 kwhrs/thou. cu. metres
52.	oxygen gas	mil. cu. meteres	25·5	29·0	90·0	135·0	58·65	66·70	207·00	310·50	2300 kwhrs/thou. cu.metres
	nitrogenous fertilizers										
53.	electrolytic process	thou. tonnes	70·0	70·0	75·0	80·0	1120·00	1120·00	1200·00	1280·00	16000 kwhrs/tonne
54.	coal based process	thou. tonnes	155·0	150·0	335·0	420·0	589·00	570·00	1273·00	1596·00	3800 kwhrs/tonne
55.	naphtha based process	thou. tonnes	9·0	5·0	1590·0	3500·0	27·00	15·00	4770·00	10500·00	3000 kwhrs/tonne
56.	phosphatic fertilizers	thou. tonnes	131·0	121.0	1000·0	1700·0	58·95	54·45	450·00	765·00	450 kwhrs/tonne
57.	vegetable oils	mil. tonnes	2·2	2·2	2·7	3·8	308·00	308·00	378·00	532·00	140 kwhrs/tonne
58.	vanaspati	thou. tonnes	366·0	426·0	600·0	1000·0	80·52	93·72	132·00	220·00	220 kwhrs/tonne
59.	paints and varnishes (organised sector)	thou. tonnes	75·0	71·0	140·0	250·0	2·63	2·49	4·90	8·75	35 kwhrs/tonne
60.	soap	thou. tonnes	167·0	163·0	250·0	400·0	33·40	32·60	50·00	80·00	200 kwhrs/tonne

Table MB. 3 (*a*) : Material Balance : Electricity : Major Industrial Consumption
India : 1964-65, 1965-66, 1970-71 and 1975-76—*contd.*

consuming industry	unit	actual production		production target		requirement of electricity (million kwhrs)				'norms' rate of consumption
		1964-65	1965-66	1970-71	1975-76	1964-65	1965-66	1970-71	1975-76	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
61. matches	mil. gross boxes	35·4	36·8	41·6	52·0	21·24	22·08	24·96	31·20	600 kwhrs/thou. gross boxes
62. D.D.T.	thou. tonnes	2·6	2·8	8·0	12·0	7·90	8·50	24·32	36·48	3040 kwhrs/tonne
63. petroleum refining	mil. tonnes	8·4	9·4	20·0	35·0	260·40	291·40	620·00	1085·00	31 kwhrs/tonne
64. glass	thou. tonnes	201·0	280·0	500·0	750·0	18·09	25·20	45·00	67·50	90 kwhrs/tonne
65. refractories	thou. tonnes	703·0	674·0	1500·0	2500·0	30·93	29·66	66·00	110·00	44 kwhrs/tonne
66. cement	mil. tonnes	9·8	10·8	20·0	30·0	1176·00	1296·00	2400·00	3600·00	120 kwhrs/tonne
67. diesel engines	thou. nos.	74·1	92·0	200·0	300·0	5·55	6·90	15·00	22·50	75 kwhrs/no.
68. sewing machines	thou. nos.	330·0	433·0	900·0	1800·0	19·89	25·98	54·00	108·00	60 kwhrs/no.
69. refrigerators	thou. nos.	30·5	31·0	65·0	200·0	3·35	3·41	7·15	22·00	110 kwhrs/no.
70. electric lamps	mil. nos.	98·0	100·0	185·0	500·0	14·70	15·00	27·75	75·00	150 kwhrs/thou. nos.
71. electric fans	thou. nos.	1276·0	1360·0	3500·0	5500·0	19·14	20·40	52·50	82·50	15 kwhrs/no.
72. radio receivers	thou. nos.	512·0	606·0	1500·0	3500·0	9·21	10·91	27·00	63·00	18 kwhrs/no.
73. automobiles (commercial vehicles, cars, jeeps etc.)	thou. nos.	71·0	70·0	150·0	270·0	85·20	84·00	180·00	324·00	1200 kwhrs/no.
74. bicycles	thou. nos.	1442·0	1581·0	3500·0	4500·0	21·63	23·72	53·00	68·00	15 kwhrs/no.
75. steel pipes and tubes	thou. tonnes	260·0	241·0	900·0	1500·0	27·30	25·31	94·50	157·50	105 kwhrs/tonne
76. machinery	index					920·00	1150·00	2875·00	5175·00	
77. total (rounded)						16269	17520	42363	68575	

PPD/Sept. 1966.

Table MB. 4 : Material Balance : Iron Ore
India : 1965-66, 1970-71 and 1975-76

consuming product	production of consuming product (thou. tonnes)			consumption norms tonnes/ tonne	requirement of iron ore (thousand tonnes)		
	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. pig iron for foundry use	1200	2000	5260	1·7	2000	5100	8900
2. pig iron for steel ingots[1]	5900	9700	17740	1·7	10000	16500	30200
3. addition to stocks of pig iron and steel plants[2]					—	7400	10900
4. total requirement					12000	29000	50000
5. indigenous production					24500	54000	84000
6. imports (plus)					—	—	—
7. exports (minus)					12300	25000	34000
8. total availability					12200	29000	50000

Note : [1] Corresponding to steel ingot production of 6·4 million tonnes, 11·2 million tonnes and 20·9 million tonnes in 1965-66 1970-71 and 1975-76 respectively (excluding 0·12, 0·5 and 0 5 million tonnes of production by electric furnaces in 1965-66, 1970-71 and 1975-76 respectively). [2] Provisions for full capacity productions at the integrated steel and pig iron plants.

PPD/Sept. 1966.

Table MB. 5 : Material Balance : Limestone
India : 1965-66, 1970-71 and 1975-76

consuming product	production of consuming product (thousand tonnes)			consumption norms tonnes/ tonne	requirement of limestone (thousand tonnes)		
	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. cement	10800	20000	30000	1·60	15000[1]	28400[1]	44000[1]
2. blast furnace limestone	7100	12700	23000	0·37	2630	4700	8500
3. steel melting shop limestone	6525	11700	21400	0·12	780	1400	2600
sugar							
4. carbonation process	820	820	820	0.38	312	312	312
5. sulphitation process	2580	3650	5950	0·04	103	150	240
6. soda ash	331	600	900	1·10	365	660	990
7. caustic soda-chemical	20	50	80	0·20	4	10	16
8. calcium carbide	50	60	80	2·00	100	120	160
9. glass	280	500	750	0·029	8	15	22
10. nitro-lime fertilizer (N_2)	103	185	300	4·00	412	740	1200
11. ferro-manganese	150	300	400	0·50	75	150	200
12. paper and paperboard (including newsprint)	590	1050	1950	0·826	490	870	1800
13. construction				index	1000	1800	3000
14. addition to stock					—	1673	960
15. total requirement					21279	41000	64000
16. domestic production					20000	41000	64000
17. imports (plus)					—	—	—
18. exports (minus)					—	—	—
19. total availability					20000	41000	64000

Note : [1] About 1·26 million tonnes, 2·23 million tonnes and 2·50 million tonnes of cement production in 1965-66, 1970-71 and 1975-76 respectively are based on slags, sea sands etc. and would require no limestone.

PPD/Sept. 1966.

Table MB. 6 : Material Balance : Bauxite
India : 1965-66, 1970-71 and 1975-76

consuming product	production of comsuming product (thousand tonnes)			consumption norms tonnes/ tonne	requirement of bauxite (thousand tonnes)		
	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. aluminium	61·3	330	400	5·5	337	1800	2200
2. cement	10800	20000	30000	0·004	44	80	120
3. aluminium sulphate	90	150	240	0·41	37	62	100
4. refractories	703	1500	2500	0·17	120	258	430
5. krosene refining	1540	3840	6200	0·013	20	50	80
6. other uses					60	200	300
7. addition to stocks					5	80	120
8. total requirement					623	2530	3350
9. indigenous production					680	2600	3650
10. (imports plus)					—	—	—
11. exports (minus)					57	70	300
12. total availability					623	2530	3350

PPD/Sept. 1966.

Table MB. 7 : Material Balance : Chromite
India : 1965-66, 1970-71 and 1975-76

consuming products	production of consuming product (thousand tonnes)			consumption norms tonnes/ tonne	requirement of chromite (thousand tonnes)		
	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. ferro-chrome	—	40	60	2·20	—	88	132
2. refractories[1]	28	60	100	0·59	17	36	59
3. bichromates	7	12	25	2·00	14	24	50
4. total requirement					31	148	241
5. indigenous production					57·5	150	250
6. imports (plus)					—	—	—
7. exports (minus)					25·5	—	—
8. total availability					32	150	250

Note : [1]Approximately 4 per cent of total refractories are chromite refractories.
PPD/Sept. 1966.

Table MB. 8 : Material Balance : Manganese Ore
India : 1965-66, 1970-71 and 1975-76

consuming product	production of consuming product				consumption norms tonnes/ unit	requirement of manganese ore (thousand tonnes)		
	unit	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. pig iron (blast furnace)	thou. tonnes	7166	12700	23000	47	337	590	1080
2. ferro-manganese	thou. tonnes	150	300	400	2000	300	600	800
3. battery manufacture	mil. nos.	293	600	900	50	15	30	45
4. total requirement						652	1220	1925
5. indigenous production						1562	3200	4400
6. exports						652[1]	2000	2400
7. total availability						910	1200	2000

Note : [1]Excluding 699000 tonnes of ferruginous manganese ore.
PPD/Sept. 1966.

Table MB. 9 : Material Balance : Cement
India : 1965-66, 1970-71 and 1975-76

consuming sector	investment (Rs. million)			cement consumption norms tonnes per million Rs. investment	requirement of cement (thousand tonnes)		
	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. agriculture and allied activities	5600	8340		450	2520	3753	—
2. power	2800	5040		325	910	1638	—
3. mining and industry	8000	16580		250	2000	4145	—
4. transport (including department's own resources)	6600	10490		250	1650	2622	—
5. social services	4500	8860		750	3375	6645	—
6. inventories	2000	4600			—	—	—
7. total investment at current prices	29500	53910	81250		10455	18803	28339
8. deflated at 1960-61 prices[1]	23790	37440	56420		8431	13058	19680
9. cement consuming industries					700	1250	2000
10. maintenance					963	1506	2368
11. stocks					200	500	1000
12. miscellaneous (incl. defence)					1040	1603	2302
13. total requirement					11334	17917	27350
14. indigenous production					10800	19000[2]	29000
15. imports (plus)					—	—	—
16. exports (minus)					30	500	1500
17. total availability					10770	18500	27500

Note : [1]Deflated by 24 per cent for 1965-66 and by 44 per cent for 1970-71 and 1975-76; and [2]Production target of 20 million tonnes is indicated in the Draft Outline.

PPD Sept. 1966.

Table MB. 10 : Material Balance : Asbestos
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/ product	production of consuming product (thousand tonnes)				consumption norms tonnes tonne	requirement of asbestos (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. asbestos cement	388	389	750	1200	0·10	39	39	75	120
2. others (auto ancillaries, pressure pipes etc.)						2	2	5	10
3. total requirement						41	41	80	130
4. indigenous production						3	4·5	10	20
5. imports						40	29	70	110
6. total availability						43	33·5	80	130

PPD/Sept. 1966.

Table MB. 11 : Material Balance : Mild Steel
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	unit	production of consuming product				consumption norms tonnes unit	requirement of rolled steel (thousand tonnes)			
		1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. steam locomotives	nos.	221	203	47	—	150	33	30	7	—
2. diesel locomotives	nos.	18	39	250	300	55	1	2	14	17
3. electric locomotives	nos.	27	32	150	250	95	3	3	14	24
4. wagons	thou. nos.	34	34	40	55	12000	408	408	480	660
5. passenger coaches	nos.	1850	1900	2000	2300	30	56	57	60	69
6. jeeps, cars & stn. wagons	thou. nos.	34	35·4	70	120	1200	41	42	84	144
7. commercial vehicles	thou. nos.	37	35·3	80	150	4000	148	141	320	600
8. auto ancillaries & parts	Rs. million	330	490	1000	1500	150	50	74	150	225
9. motor cycles & scooters	thou. nos.	37·4	44	120	200	86	3	4	10	17
10. bicycle parts & accessories	Rs. million	90	96	200	300	200	18	19	40	60
11. bicycles complete	thou. nos.	1442	1582	3500	4500	20	29	32	70	90
12. ship building	thou. GRT	50	50	100	200	650	32	33	65	130
13. *sub-total : transport equipment*							*822*	*845*	*1314*	*2036*
14. turbo-generators	thou. kw.	—	—	2200	4200	9	—	—	20	38
15. electric motors	thou. kw.	1100	1310	4500	6300	3·5	4	5	16	22
16. electric transformers	mil. kva.	3·6	4·5	12	21	3000	11	14	36	63
17. control gear & switchgear	Rs. million	46·5	170	400	750	45	2	8	18	34
18. ACSR conductors	thou. tonnes	49	41	125	160	324	16	13	41	52
19. electric fans	thou. nos.	1276	1360	3500	5500	7	9	10	25	39
20. radio receivers	thou. nos.	512	606	1500	3500	3·5	2	2	5	12
21. refrigerators	thou. nos.	30·5	31	65	200	145	4	4	9	29
22. air conditioners	thou. nos.	10·3	12·4	65	130	381	4	5	25	50
23. water coolers	thou. nos.	2·4	3·7	30	50	101	neg.	neg.	3	5
24. *sub-total : electrical equipment*							*52*	*61*	*198*	*344*
25. cranes	thou. tonnes	12·3	15	75	100	794	10	12	60	79
26. ball and roller bearings	mil. nos.	6	9	30	60	700	4	6	21	42
27. precision instruments	Rs. million	90	90	450	1000	1	neg.	neg.	0·5	1

28.	machine tools	Rs. million	239	292	1050	1600	45	11	13	47	7
29.	diesel engines	thou. nos.	73·8	93	200	300	117	9	11	23	35
30.	power driven pumps	thou. nos.	184	240	400	500	16	3	4	6	8
31.	air compressors	Rs. million	36	35	160	250	50	2	2	8	13
32.	power boilers	thou. sq. hr.	—	neg.	5600	11000	10	—	neg.	56	110
33.	industrial boilers	Rs. million	51	46	250	400	300	15	14	75	120
34.	chemical machinery etc.	Rs. million	67·3	80	360	800	385	26	31	139	308
35.	metallurgical machinery	thou. tonnes	2·7	11	70	160	550	1	6	39	88
36.	coal and other mining machinery	thou. tonnes	2·3	7	50	90	750	2	5	38	68
37.	cotton textile machinery	Rs. million	211	280	550	650	135	28	38	74	88
38.	cement machinery	Rs. million	21·4	35	200	300	115	3	5	23	35
39.	sugar machinery	Rs. million	88	76	160	250	87	8	7	14	22
40.	paper machinery	Rs. million	15	20	200	300	50	1	1	10	15
41.	printing machinery	Rs. million	0·2	1	50	150	50	neg.	neg.	3	8
42.	jute textile machinery	Rs. million	32	35	80	150	61	2	2	5	9
43.	dairy machinery	Rs. million	6	10	50	90	22	neg.	neg.	1	2
44.	tea processing machinery	Rs. million	15·2	11	21	45	190	3	2	4	9
45.	construction machinery	Rs. million	24·1	27	180	300	220	5	6	40	60
46.	crawler tractors	nos.	—	—	650	1200	9	—	—	6	11
47.	dumpers and scrapers	nos.	—	50	650	1200	7	—	neg.	5	8
48.	shovels	nos.	—	—	225	350	21	—	—	5	7
49.	road rollers	nos.	1096	1123	1600	2200	6	7	7	10	13
50.	tractors	thou. nos.	2·7	5·6	35	150	890	2	5	31	134
51.	tractor drawn implements							—	20	100	300
52.	typewriters	thou. nos.	44·7	40	200	300	18	1	1	4	5
53.	sewing machines	thou. nos.	330	433	900	1800	8	3	3	7	14
54.	steel furniture	thou. tonnes	42	41	100	150	1230	52	50	123	185
55.	wire ropes	thou. tonnes	10	12	45	90	1000	10	12	45	90
56.	welding electrodes	mil. r.metre	240	200	500	700	125	30	25	63	88
57.	reduction gears	Rs. million	13·6	13·8	300	500	33·3	5	5	100	167
58.	conduit pipes	mil.r.metre	2·1	1·6	3·7	7·6	860	1	1	3	7
59.	lifts	nos.	400	500	1250	2500	2·86	1	1	4	7
60.	enamelware	mil. nos.	36	36	60	90	900	32	32	54	81

Table MB. 11 : Material Balance : Mild Steel
India : 1964-65, 1965-66, 1970-71 and 1975-76—*contd.*

consuming industry/product	production of consuming product					consumption norms tonnes/unit	requirement of rolled steel (thousand tonnes)			
	unit	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
61. containers & drums .	thou. tonnes	100	110	500	800	1200	120	132	600	960
62. *sub-total : other industrial machinery*							*397*	*459*	*1846*	*3269*
63. total specified industries .							1271	1365	3358	5649
64. spares							127	136	336	565
65. small scale industries .							400	400	600	900
66. other misc. users (including defence) . . .							250	269	613	1023
67. total manufacturing industries							2048	2170	4907	8137
68. addition to stocks . .							200	125	325	500
69. total (67 and 68) . .							2248	2295	5232	8637
70. construction[1] . . .							2700	2880	4600	6800
71. total requirement . .							4948	5175	9832	15437
72. indigenous production .							4430	4425	8800	15500
73. imports (plus) . . .							900	800	1500	1000
74. exports (minus). . .							100	200	500	1000
75. total availability . .							5230	5025	9800	15500

Note : [1]Details of steel requirements for construction given in Table MB. 11(a).

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Table MB. 11 (*a*) : Mild Steel Requirement for Construction India : 1965-66, 1970-71 and 1975-76

item	investment (Rs. million)			steel consumption norms tonnes per million Rs. investment	requirement of steel (thousand tonnes)		
	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. agriculture and allied activities	5600	8340		25	140	208	—
2. power	2800	5040		200	560	1008	—
3. mining and industry	8000	16580		90	720	1492	—
4. transport (including department's own resources)	6600	10490		210	1386	2203	—
5. social services	4500	8860		175	788	1551	—
6. inventories	2000	4600		—	—	—	—
total investment							
7. at current prices	29500	53910	81250		3594	6462	9739
8. deflated at 1960-61 prices[1]	23790	37440	56420		2898	4488	6763
9. maintenance					306	465	692
10. miscellaneous (including defence construction)					328	417	541
11. total requirement for construction, of which :					3532	5370	7996
12. finished steel (incl. steel pipes)					2882	4565	6796
13. cast iron pipes and castings					650	805	1200

Note : [1]Deflated by 24 per cent in 1965-66 and by 44 per cent in 1970-71 and 1975-76.

Table MB. 12 : Material Balance : Special Steels India : 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product				consumption norms tonnes/ unit	requirement of special steels (thousand tonnes)		
	unit	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. steam locomotives	nos.	203	47	—	4·0	0·81	0·19	—
2. electric locomotives	nos.	32	150	250	5·5	0·18	0·83	1·38
3. diesel locomotives	nos.	39	250	300	5·5	0·21	1·38	1·65
4. wagons	nos.	34000	40000	55000	0·2	6·80	8·00	11·00
5. passenger coaches	nos.	1900	2000	2300	0·3	0·57	0·60	0·69
6. automobiles	thou. nos.	71	150	270	430	30·53	64·50	116·10
7. bicycles	thou. nos.	1582	3500	4500	1·05	1·66	3·68	4·73
8. ships	thou. GRT	50	100	200	4	0·20	0·40	0·80
9. *sub-total : transport equipment*						*40·96*	*79·58*	*136·35*
10. generators	thou. kw	—	2200	4200	1·8	—	3·96	7·56
11. electric motors	thou. kw	1310	4500	6300	1·8	2·36	8·10	11·34
12. transformers	thou. kva	4500	12000	21000	0·06	0·27	0·72	1·26
13. switchgears	Rs. million	170	400	750	1·8	0·31	0·72	1·35
14. *sub-total : electrical equipment*						*2·94*	*13·50*	*21·51*

Table MB. 12 : Material Balance : Special Steels
India : 1965-66, 1970-71 and 1975-76—*contd.*

consuming industry/product	unit	production of consuming products 1965-66	1970-71	1975-76	consumption norms tonnes/unit	requirement of special steels (thousand tonnes) 1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
15. metallurgical	thou. tonnes	11	70	160	16·6	0·18	1·16	2·66]
16. oil drilling	Rs. million	25	100	250	85	2·13	8·50	21·25
17. refining equipment	thou. tonnes	—	100	160	150	—	15·00	24·00
18. chemical equipment	Rs. million	80	360	800	8	0·64	2·88	6·40
19. cotton textile	Rs. million	280	550	650	8	2·24	4·40	5·20
20. food machinery	Rs. million	94	350	450	12	1·13	4·20	5·40
21. coal machinery	thou. tonnes	7	50	90	15	0·11	0·75	1·35
22. cranes and liftings	thou. tonnes	15	75	100	90	1·35	6·75	9·00
boilers								
23. power	tonne. st. hr.	neg.	5600	11000 }	0·65	—	3·64	7·15
24. industrial	tonne. st. hr.	736	4000	6500 }		0·48	2·60	4·23
25. turbines	thou. kw	—	2200	4200	0·6	—	1·32	2·52
26. diesel engines (stationary)	thou. nos.	93	200	300	180	16·74	36·00	54·00
27. agricultural tractors	nos.	5600	35000	150000	0·13	0·73	4·55	19·50
28. machine tools	Rs. million	292	1050	1600	17·5	5·11	18·38	28·00
29. *sub-total : industrial machinery*						*30·84*	*110·13*	*190·66*
30. *small scale industries*	*thou. tonnes*	*600*	*1000*	*1500*	*5·5*	*3·30*	*5·50*	*8·25*
31. bolts, nuts and rivets	thou. tonnes	45	100	160	68	3·06	6·80	10·88
32. ball bearings	mill. nos.	8 8	30	60	435	3·83	13·05	26·10
33. structural fabrication n.e.s.	thou. tonnes	300	1100	2000	1·5	0·45	1·65	3·00
34. small tools/hand tools	thou. tonnes	31	50	80	270	8·37	13·50	21·00
35. cutlary and utensils	tonnes	—	5000	8000	2	—	10·00	16·00
36. *sub-total : other manufactures specified*						*15·71*	*45·00*	*77·58*
37. spares						10·00	26·80	45·45
38. construction						0·55	1·00	1·55
39. miscellaneous (including defence)						12·15	26·40	42·95
40. total						116·45	307·91	524·30
41. stocks						5·80	15·40	26·21
42. total requirement						122·25	323·31	550·51
43. indigenous production						—	300	600
44. imports (plus)						108	25	—
45. exports (minus)						—	—	—
46. total availability						108	325	600

Note : 'Special steel' in this table does not include spring steels and free cutting steels which have been shown under 'special steel' in Draft Outline. The estimated demand for these categories in 1970-71 is about 150000 tonnes.

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Table MB. 13 : Material Balance : Aluminium
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	unit	production of consuming product				consumption norms tonnes/unit	requirement of aluminium (thou. tonnes)			
		1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. A.C.S.R. conductors and accessories	thou. tonnes	49[1]	41[1]	95	120	700	34·3	28·7	66·5	84·0
2. A.A. conductors and accessories	thou. tonnes			30	40	1000			30·0	40·0
3. bus bars for electrical industries							—	—	5·0	8·0
4. electric motors	thou. kw	1100	1310	4500	6300	2·4	2·6	3·1	10·8	15·1
5. fans	thou. nos.	1276	1360	3500	5500	0·8	1·0	1·1	2·8	4·4
6. refrigeration machinery	Rs. million	73	130	460	700	6	0·4	0·8	2·8	4·2
7. other electrical manufacturing	Rs. million	46·5	60	500	750	6	0·3	0·4	3·0	4·5
8. radios and related products estimated substitution by aluminium	thou. nos.	512	606	1500	3500	0·5	0·3	0·3	0·8	1·8
9. PVC and VIR cables[3]	mil. metres	379 (—)	367 (—)	1200 (600)	2000 (1600)	15	—	—	9·0	24·0
10. paper insulated wires and cables[3]	kilometres	3160 (—)	4477 (1600)	20000 (8000)	25000 (15000)	1·7	—	2·7	13·6	25·5
11. automobiles	thou. nos.	71	71	150	270	50-60-70[4]	3·6	3·6	9·0	18·9
12. railway coaches	nos.	1850	1900	2000	2300	0·3	0·6	0·6	0·6	0·7
13. other transport equipment (ships, locos, trailers etc.)	thou. tonnes	75	75	110	190	10	0·8	0·8	1·1	1·9
14. food processing machinery	Rs. million	110	94	350	450	0·5	0·5	0·5	1·8	2·2
15. textile machinery	Rs. million	211	280	550	650	6	1·3	1·7	3·3	3·9
16. chemical and pharmaceutical machinery (excluding fertilizers plant)	Rs. million	67·3	80	360	800	5	0·3	0·4	1·8	4·0
17. internal combustion engines.	thou. nos.	74	93	260	300	40	3·0	3·7	8·0	12·0
18. furniture and fixture	thou. tonnes	42	41	100	150	28	1·2	1·1	2·8	4·2
19. canning and packing							6·0	7·5	15·0	25·0
20. building construction[5]	index						3·2	4·0	8·1	11·5
21. domestic utensils etc.[6]	thou. tonnes						11·0	12·1	19·5	32·0
22. total							70·4	73·1	215·3	327·8
23. miscellaneous (including defence)							8·5	8·7	25·6	41·4
24. production reserves							5·6	5·9	17·0	26·2

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Table MB. 13 : Material Balance : Aluminium

India : 1964-65, 1965-66, 1970-71 and 1975-76 — *contd.*

consuming industry product	production of consuming product					consumption norms tonnes/ unit	requirement of aluminium (thou. tonnes)			
	unit	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
25. addition to stock . .							0·5	0·6	2·6	4·0
26. total requirement . .							85·0	88·3	260·5	399·4
27. indigenous production .							54·1	61·3	270	459
28. estimated availability of secondary scrap . .							7·0	7·0	20	30
29. imports (plus) . . .							22·9	20·3	—	—
30. exports (minus) . .							—	—	30	50
31. total availability . .							84·0	88·6	260	430

Note: [1]Includes A.A. conductors; [2]Assumed substitution to the extent of 50 per cent in 1970-71 and 80 per cent in 1975-76. Figures in brackets indicate the production based on aluminium conductors; [3]Substitution of 1600 kms., 8000 kms., 15000 kms. based on copper by aluminium conductors assumed in the years 1965-66, 1970-71 and 1975-76 respectively; [4]Norms of aluminium consumption assumed to rise from 50 to 70 tonnes by 1975-76 in view of anticipated increased use of aluminium in the automobile industry; [5]Related to estimated steel consumption for construction; [6]Assumed to increase by 10 per cent per annum, 5 per cent normal growth plus 5 per cent for copper replacement; and [7]Production for 1970-71 as indicated in the Draft Outline is 330000 tonnes. The discrepancy is reduced if the substitution of Copper by aluminium in items 9 and 10 is assumed to be 100 per cent by 1970-71 leading to an additional demand for aluminium of about 30000 tonnes. There will be corresponding reduction of demand for copper. This aspect needs closer study.

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Table MB. 14 : Material Balance : Copper
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product					consumption norms tonnes/unit	requirement of copper (thousand tonnes)			
	unit	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. electric motors	thou. kw.	1100	1310	4500	6300	1·6	1·8	2·1	6·5[1]	8·1[1]
2. transformers	thou. kva	3600	4500	12000	21000	1·9	6·8	8·6	20·5	31·9
3. bare copper conductors	tonnes	5300	3000	4000	4000	1·0	5·3	3·0	4·0	4·0
4. PVC and VIR cables[2]	mil. metres	379	367	1200	2000	29·0	11·0	10·6	17·4	11·6
5. paper insulated wires and cables[3]	kilometres	3160	4477	20000	25000	1·5	4·7	6·7	27·0	36·0
6. electric fans	thou. nos.	1276	1360	3500	5500	1·0	1·3	1·4	3·5	5·5
7. switch and control gear	Rs. million	46·5	170	400	750	10·0	0·5	1·7	4·0	7·5
8. refrigerators and air conditioners	Rs. million	73	80	260	700	6·0	0·4	0·5	1·6	4·2
9. telephone and telegraph equipment							0·9	2·0	8·0	15·0
10. *sub-total : electricals*							*32·7*	*36·6*	*92·5*	*123·8*
11. automobiles	thou. nos.	71	71	150	270	50·0	3·6	3·6	7·5	13·5
12. locomotives	nos.	271	325	447	650	2·5	0·7	0·8	1·1	1·6
13. food product machinery	Rs. million	110	94	350	450	1·0	1·1	0·9	3·5	4·5
14. pumps and compressors	thou. nos.	188	240	400	500	4·0	0·8	1·0	1·6	2·0
15. bolts, nuts, washers etc.	thou. tonnes	34	45	100	160	20·0	0·7	0·9	2·0	3·2
16. non-ferrous metal alloys etc.	thou. tonnes	4·4	4·1	20	25	750	3·3	3·1	15·0	18·8
17. chemical industries equipment	Rs. million	67·3	80	360	750	10·0	0·7	0·8	3·6	7·5
18. diesel engines	thou. nos.	74	92·6	200	300	10·0	0·7	0·9	2·0	3·0
19. metal powders							1·0	1·0	1·5	2·0
20. small scale industries (including utensils)							11·3	11·3	15·0	20·0
21. *sub-total : non-electricals*							*23·9*	*24·3*	*52·8*	*76·1*
22. total							56·6	60·9	145·3	199·9
23. misc. requirements							5·7	6·0	14·5	20·0
24. consumption: all industries							62·3	66·9	159·8	219·9

Table MB. 14 : Material Balance : Copper
India : 1964-65, 1965-66, 1970-71 and 1975-76—*contd.*

consuming industry/product	production of consuming product: unit	1964-65	1965-66	1970-71	1975-76	consumption norms tonnes/unit	requirement of copper (thousand tonnes): 1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
25. production reserves of consumers							5·0	5·4	12 8	17·6
26. requirements for repairs, maintenance etc.							1·2	1·3	3·0	4·0
27. total requirement							68·5	73 6	175·6	241·5
28. indigenous production							9 4	9 4	37·5	70·0
29. imports							58·4	58·4	120·0	150·0
30. availability of scrap							7·0	7·5	18·0	24 0
31. total availability							74·8	75·3	175·5	244 0

Note : [1]Approximately 10 per cent saving of copper assumed in 1970-71 and 20 per cent in 1975-76 by the use of aluminium die-cast rotors for certain types of motor aluminium windings for distribution transformers upto 500 kva; [2]Substitution of copper in PVC and VIR cables by aluminium to the extent of 50 per cent in 1970-71 and 80 per cent in 1975-76 ; and [3]Substitution by aluminium assumed at 10 per cent and 20 per cent respectively by 1970-71 and 1975-76.

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Table MB. 15 : Material Balance : Lead
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product				con-sumption norms	requirement of lead (thousand tonnes)			
	unit	1964-65	1965-66	1970-71	1975-76	tonnes/unit	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. storage batteries	thou. nos.	780	710	1800	3000	17	13·3	12·1	31	51
2. electric cables[1]	kilometres	3160	4477	20000	25000	3	9·5	12·1	27	26
3. pigments and compounds[2]	thou. tonnes	75	70	140	250	100	7·5	7·0	14	25
4. chemical plant and equipment.	Rs. million	67	80	360	750	11·4	0·8	0·9	4·1	8·5
5. printing metal and alloys[3]							5·2	5·8	10·5	19·5
6. construction							0·7	0·8	2·4	4
7. sub-total							37·0	38.7	89 0	134
8. others (including defence)							5·0	5 1	9	12
9. stocks & reserves of consumers							3·2	3·3	7	11
10. total requirement							45·2	47·1	105	157
11. secondary scrap							6·0	8·0	15	25
12. indigenous production							3·5	2·6	9	40
13. imports							34·1	35 2	81	95
14. total availability							43·6	45·8	105	160

Note: [1]Replacement of lead for sheeting of cables by PVC and aluminium assumed at 10, 55 and 65 per cent respectively in 1965-66, 1979-71 and 1975-76; [2]Substitution by titanium dioxide, lithopone and other pigments assumed in 1970-71 and 1975-76; and [3]Related to index of production of paper.

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Table MB. 16 : Material Balance : Zinc
India : 1965-66, 1970-71 and 1975-76

consuming industry product	production of consuming product				norms of consumption tonnes unit	requirement of zinc (thou. tonnes)		
	unit	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. galvanising[1]						48·0	70·0	110·0
2. dry cell manufacture	mil. nos.	293	600	900	2·5	7·3	15·0	22·5
3. non-ferrous metal alloys	th. tonnes	4	20	25	250·0	1·0	5·0	6·3
4. chemicals[2]	th. tonnes	10	20	35	800·0	8·0	8·0	14·0
5. utensils and small scale industries						16·0	20·0	30·5
6. others (including defence, stocks etc.)						8·0	12·0	18·0
7. total requirement						88·3	130·0	201·3
8. indigenous production						5	70	100
9. imports						81[3]	60	101
10. total availability						86	130	201

Note : [1]Economy in the use of zinc assumed in 1970-71 and 1975-76, by change-over to aluminising of transmission line towers and other steel products and improving zinc efficiency in the existing galvanising plants from the present level of 54 per cent to 65 per cent; [2]Replacement of zinc oxide by titanium dioxide in paint industry assumed in 1970-71 and 1975-76; and [3]For eleven months only.

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Table MB. 17 : Material Balance : Tin
India : 1965-66, 1970-71 and 1975-76

consuming industry product	production of consuming product				norms of consumption tonnes/ unit	requirement of tin (tonnes)		
	unit	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. tin plate	th. tonnes	110	230	450	15	1650	3450	6750
2. electric cables	mil. metres	367	1200	2000	0·8	294	960	1600
3. copper alloys (bronzes and brasses)	th. tonnes	4·5	20	25	100	450	2000	2500
4. solder and soft alloys						400	600	1000
5. tinning of utensils and other misc. uses						550	880	1150
6. sub-total						3344	7890	13000
7. reserves with consumers						290	630	1000
8. total requirement						3634	8520	14000
9. indigenous production						—	—	—
10. imports (plus)						3842	8520	14000
11. exports (minus)						—	—	—
12. total availability						3842	8520	14000

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Table MB. 18 : Material Balance : Sulphur
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product (thousand tonnes)				consumption norms tonnes/tonne	requirement of sulphur (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. sulphuric acid	694	654	2400	4500	0·33	229	216	792	1485
2. carbon disulphide	25	26	32	60	0·8	20	21	26	48
3. sugar	3260	3400	4500	6800	0·005	16·3	17	23	34
4. rubber (vulcanisation)	85	95	191	340	0·025	2·1	2·4	5	9
5. paper and paper board	525	590	1050	2000	0·005	2·6	2·9	6	10
6. sodium hydrosulphite	3·8	4	10	20	0·5	1·9	2	5	10
7. sub-total						271·9	261·3	857	1596
8. miscellaneous						13·2	13·1	45	60
9. reserves with consumers						10	11	40	60
10. total requirement						295·1	285·4	942	1716
indigenous supply/production									
11. pyrites[1] (expressed in terms of sulphur)						—	—	84	350
12. zinc and copper smelters						2	3	30	100
13. refinery and coke-oven gases						1	1	5	15
14. imports						278	298	823	1251
15. total availability						281	302	942	1716

Note : [1]Pyrites contain on an average 35 per cent sulphur. Mining of 2·4 lakh tonnes of pyrites per annum is envisaged by P.C.D.C. by 1967-68.

PPD/Sept. 1966.

Table MB. 19 : Material Balance : Sulphuric Acid (100%)
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product (thousand tonnes)				consumption norms tonnes/tonne	requirement of sulphuric acid (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. phosphatic fertilizers (in terms of P_2O_5) excluding nitrophosphate	131	119	960	1620	2·6–2·7[1]	340	321	1944[2]	3280[2]
2. ammonium sulphate (N_2) (based on the use of H_2SO_4)	26	20	60	80	3·75	98	75	225	300
3. nitrophosphate (P_2O_5)	—	2	40	80	0·23	—	0·5	9	18
4. pickling of finished steel	4430	4425	8800	15500	0·006	27	27	53	93
5. viscose rayon filament and staple fibre	70	74	90	150	1·4	98	104	126	210
6. aluminium sulphate	81	90	150	240	0·51	41	46	77	122
7. petroleum refining[3]	8·4	9·4	20	35	0·0012	10	11	24	42
8. titanium dioxide	4·3	6	15	25	2·20	9	13	33	55
9. D.D.T.	2·6	2·8	8	12	2·0	5·2	6	16	24
10. bichromates	7	7	12	25	0·5	3·5	3·5	6	13
11. alums	1·9	0·8	4	20	0·3	0·6	0·3	1·2	6
12. copper sulphate	4·7	5	8	12	0·4	1·9	2	3·2	5
13. sub-total						634·2	609·3	2517·4	4168
14. miscellaneous uses						31·8	30·7	125·6	212
15. total requirement						666	640	2643	4380
16. indigenous production						694	654	2400[4]	4500
17. imports (plus)						—	—	—	—
18. exports (minus)						—	—	—	—
19. total availability						694	654	2400	4500

Note : [1]Consumption at the rate of 2·6 tonnes/tonne is used for estimating the requirements of 1964-65 and 2·7 tonnes/tonne for 1965-66 to 1975-76; [2]Assumptions, 25 per cent replacement in 1970-71 and in 1975-76 by: (*i*) partial use of ground rock, (*ii*) use of cit. soluble DCP and mixed type of fertilizer by modified ODDA process, (*iii*) rock conversion by hydrochloric acid and (*iv*) imported phosphoric acid ; [3]Production figures are in million tonnes; and [4] Production target as given in the Draft Outline of the Fourth Plan.

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Table MB. 20 : Material Balance : Caustic Soda
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product (thousand tonnes)				consumption norms tonnes/tonne	requirement of caustic soda (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. paper and paperboard	495	560	900	1700	0·10	49·5	56	90	170
2. newsprint	30	30	150	300	0·05	1·5	1·5	8	15
3. viscose rayon and staple fibre	70	74	90	150	1·00	70	74	90	150
4. soap[1]	410	500	800	1200	0·10	41	50	80	120
5. aluminium	54·1	61·3	330	450	0·20	10·8	12·3	66	90
6. petroleum refining[2]	8·4	9·4	20	35	0·60[3]	5	6	12	21
7. vanaspati	366	426	600	1000	0·01	3·7	4	6	10
8. dyestuffs	4·5	4·8	14	20	0·70	3·2	3	10	14
9. synthetic detergents	7·5	8	16	25	0·33	2·5	3	5	8
10. textile (index)	100	94	117	150		41	38	48	62
11. sub-total						228·2	247·8	415	660
12. miscellaneous						11·4	15·2	21	33
13. reserve and addition to stocks						18·4	20	14	20
14. total requirement						258	283	450	713
15. indigenous production						191	218	500	800
16. imports (plus)						68	74	—	—
17. exports (minus)						—	—	50	80
18. total availability						259	292	450	720

Note : [1]Includes use for unorganised sector; [2]Million tonnes; and [3]Per thousand tonnes.

PPD/Sept. 1966.

Table MB.21 : Material Balance : Soda Ash
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product (thousand tonnes)				consumption norms tonnes/tonne	requirement of soda ash (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. glass	201	280	500	750	0·30	60·3	84	150	225
2. caustic soda (chemical)	19	20	50	80	1·60	30·4	32	80	128
3. sodium silicate	104	110	200	300	0·25	26	28	50	75
4. paper and paperboard	495	560	900	1700	0·02	9·9	11	18	34
5. sodium bicarbonate	11	13	20	50	0·80	8·8	10	16	40
6. bichromates	7	7	12	25	0·80	5·6	6	10	20
7. dye-stuffs	4·5	4·8	14	20	0·82	3·7	4	11	16
8. dhobies and laundries						95	125	170	230
9. textiles (index)	100	94	117	150		10	9	12	15
10. sub-total						249·7	309	517	783
11. miscellaneous						25	31	50	77
12. reserves and addition to stocks						21·3	20	14	15
13. total requirement						296	360	581	875
14. indigenous production						282	331	600	900
15. imports (plus)						34	36	—	—
16. exports (minus)						—	—	20	25
17. total availability						316	367	580	875

PPD/Sept. 1966.

Table MB. 22 : Material Balance : Chlorine
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming product	production of consuming product (thousand tonnes)				consumption norms tonnes/tonne	requirement of chlorine (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. paper and paperboard	525	590	1050	2000	0·1	52·5	59·0	105·0	200·0
2. B.H.C.	6·2	7·4	25	40	1·4	8·7	10·4	35·0	56·0
3. D.D.T.	2·6	2·8	8	12	2·0	5·2	5·6	16·0	24·0
4. polyvinyl chloride resin	9·2	12·2	70	130	0·75	6·9	9·1	52·5	97·5
5. bleaching powder (stable)	7·8	7·2	12	20	0·4	3·1	2·9	4·8	8·0
6. cleaning fluids and refrigerants	—	0·18	5	8	1·2	—	0·2	6·0	9·6
7. chlorinated ethylene and other products (other than cleaning fluids)	—	1·6	27	50	0·8	—	1·3	21·6	40·0
8. dicalcium phosphate	—	—	10	20	0·3	—	—	3·0	6·0
9. hydrochloric acid	23	34	80	130	0·28	6·4	9·5	22·4	36·4
10. textile bleaching (index)	100	94	117	150		11·0	10·0	12·9	16·5
11. phosphoric acid (100 % P_2O_5)	2·5	1·5	3	5	2·0	5·0	3·0	6·0	10·0
12. inorganic chlorides						8·0	8·0	20·0	30·0
13. sub-total						106·8	119·0	305·2	534·0
14. water purification and other miscellaneous uses						5·2	6·2	15·8	27·0
15. total requirement						112	125	321	561
indigenous production by-product of electrolytic caustic soda						140	170	380	620
16. chlorine available[1]						28	45	59	59
17. unutilised surplus						112	125	321	561
18. total availability									

Note: [1]Based on 0·85 tonne of chlorine per tonne caustic soda produced.

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Table MB. 23 : Material Balance : Mercury
India : 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product (thousand tonnes)			consumption norms tonnes/ thousand tonnes	requirement of mercury (tonnes)		
	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
mercury cells for caustic soda[1]							
1. replacement demand for existing units	144	165	220	0·4—0·3[2]	58	50	66
2. new cells	24	65	90	2·7	65	175	244
3. pesticides and chemicals[3]					20	50	50
4. small scale industries					25	30	35
5. misc. (including ordnance requirement)					15	30	50
6. total requirement					183	335	445
7. indigenous production					—	—	—
8. imports (plus)					204[4]	335	445
9. exports (minus)					—	—	—
10. total availability					204	335	445

Note : [1]Existing installed capacity of mercury cells for caustic soda is 184000 tonnes which includes 24000 tonnes of new capacity. Additional capacity of 65000 tonnes of mercury cell based caustic soda is envisaged during the Fourth Plan; [2]Losses due to vapour spillage etc. are assumed to decrease from 0·4 t/thou. tonnes in 1965-66 to 0·3 t/thou. tonnes in 1970-71 and 1975-76 by more efficient operations of plants; [3]Requirement of pesticides and chemicals are as furnished by D.G.T.D.; and [4]Eleven months only.

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Table MB. 24 : Material Balance : Benzene
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming product	production of consuming product (thousand tonnes)				consumption norms tonnes/tonne	requirement of benzene (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. styrene for plastics	4·9	6·2	40	80	0·75	3·7	4·7	30	60
2. styrene for SBR	3·5	3·8	8·7	11·6	0·75	2·6	2·9	6·5	8·7
3. phenol	—	—	16	44	1·2	—	—	19·2	52·8
4. B.H.C.	6·2	7·4	25	40	0·44	2·7	3·3	11	17·6
5. D.D.T.	2·6	2·8	8	12	0·7	1·8	2·0	5·6	8·4
6. detergent alkyates	7·2	8·4	14	24	0·45	3·2	3·8	6·3	10·8
7. maleic anhydride	—	—	2·5	5	1·4	—	—	3·5	7·0
8. aniline	—	—	4	9	0·8	—	—	3·2	7·2
9. caprolactum	—	—	20	36	1·4	—	—	28	50·4
10. sub-total						14	16·7	113·3	222·9
11. miscellaneous and solven uses						1·4	1·7	11·2	21·1
12. total requirement						15·4	18·4	124·5	244·0
13. domestic production						19	22	110	250
14. imports (plus)						—	—	15	—
15. exports (minus)						4·7	4	—	6
16. total availability						14·3	18	125	244

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Table MB. 25 : Material Balance : Carbon Black
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product					consumption norms tonnes/unit	requirement of carbon black (thousand tonnes)			
	unit	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
tyres										
1. commercial vehicles, large tractor etc. (giant size) .	thou. nos.	1230	1450	3030	6300	7·5	9·2	10·9	22·7	47·3
2. cars and jeeps . . .	thou. nos.	700	600	1070	1650	2·0	1·4	1·2	2·1	3·3
3. motor cycles and scooters .	thou. nos.	185	200	600	1300	1·0	0·2	0·2	0·6	1·3
4. other uses, incl. for exports	thou. nos.	40	100	1000	1500	7·5	0 3	0·8	7·5	11·3
5. bicycles . . .	mil. nos.	16·5	18·5	33	50	40	0·7	0·7	1·3	2·0
tubes										
6. commercial vehicles, large tractor etc. (giant size) .	thou. nos.	1220	1400	3030	6300	2·0	2·4	2·8	6·1	12·6
7. cars and jeeps . . .	thou. nos.	640	585	1070	1650	0·8	0·5	0·5	0·9	1·3
8. motor cycles and scooters .	thou. nos.	255	200	600	1300	0·4	0·1	0·1	0·2	0·5
9. other uses, incl. for exports	thou. nos.	75	85	1000	1500	2 0	0·2	0·2	2·0	3·0
10. bicycles	million nos.	16·1	18·5	33	50	12	0·2	0·2	0·4	0·6
11. paints and inks . .	thou. tonnes	72	120	200	350	30	2·2	3·6	6·0	10·5
12. *sub-total*							*17·4*	*21·2*	*49·8*	*93·7*
13. other uses . . .							0·9	1·1	2·5	4·7
14. reserve with consumers .							1·4	1·7	3·7	7·6
15. total requirement .							19·7	24	56	106
16. indigenous production .							11·0	13	50	100
17. imports . . .							10·7	12	6	6
18. total availability . .							21·7	25	56	106

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Table MB. 26 : Material Balance : Phthalic Anhydride
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming product	production of consuming product (thousand tonnes)				consumption norms tonnes/tonne	requirement of phthalic anhydride (thousand tonnes)			
	1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. alkyd resins	4·0	6·0	14	24	0·4	1·6	2·4	5·6	9·6
2. plasticisers (phthalates)	1·3	2·1	14	30	0·6	0·8	1·3	8·4	18·0
3. anthraquinone	—	—	1·3	2·2	0·75	—	—	1·0	1·7
4. polyesters	neg.	0·124	3	10	1·3	—	0·2	3·9	13·0
5. sub-total						2·4	3·9	18·9	42·3
6. miscellaneous other uses						0·3	0·4	1·9	4·2
7. total requirement						2·7	4·3	20·8	46·5
8. indigenous production						—	—	15·6	45·0
9. imports						4·1	4·0	5·2	2·0
10. total availability						4·1	4·0	20·8	47·0

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Table MB. 27 : Material Balance : Rubber
India : 1964-65, 1965-66, 1970-71 and 1975-76

consuming industry/product	unit	production of consuming product				consumption norms tonnes/unit	requirement of rubber (thousand tonnes)			
		1964-65	1965-66	1970-71	1975-76		1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
tyres										
1. commercial vehicles, large tractors etc. (giant size)	thou. nos.	1230	1450	3030	6300	19	23·4	27·6	57·5	120·0
2. cars and jeeps	thou. nos.	700	600	1070	1650	6	4·2	3·6	6·4	9·9
3. motorcycles and scooters	thou. nos.	185	200	600	1300	6	1·1	1·2	3·6	7·8
4. tyres for trailers, earth moving equipment and export	thou. nos.	40	100	1000	1500	19	0·8	1.9	19.0	28·5
5. bicycles	mil. nos.	16·5	18·5	33	50	410	6·8	7·6	13·5	20·5
tubes										
6. commercial vehicles, large tractors etc. (giant size)	thou. nos.	1220	1400	3030	6300	2·8	3·4	3·9	8·5	18·0
7. cars and jeeps	thou. nos.	640	585	1070	1650	1·4	0·9	0·8	1·5	2·4
8. motorcycles and scooters	thou. nos.	255	200	600	1300	1·4	0·4	0·3	0·8	1·8
9. tubes for trailers, earth moving equipment and for exports	thou. nos.	75	85	1000	1500	19	1.4	1.6	19.0	28.5
10. bicycles	mil. nos.	16·1	18·5	33	50	140	2·3	2·5	4·2	7·0
11. footwear	mil. pairs	50	53	75	120	250	12·5	13·3	18·1	30·0
12. camel back	thou. tonnes	6·9	8·3	16	25	600	4·1	5·0	9·6	15·0
13. cable—rubber covered	mil. metres	14·3	15	25	40	12·2	0·2	0·2	0·3	0·5
14. waterproof fabrics	mil. metres	4·3	3·9	15	25	100	0·4	0·4	1·5	2·5
15. hoses—radiator and vacuum brake	mil. nos.	1·4	1·01	4·5	10		2·3	2·3	8·0	15·0
16. hoses—others	mil. metres	6·6	6·8	18	30					
17. belting conveyor and transmission	thou. tonnes	4·2	5	7·5	15	1200	5·8	6·8	10·1	20·6
18. fan and vee belts	thou. tonnes[1]	0·6	0·7	1·1	2					
19. others—not listed							5·0	6·0	10·0	16·0
20. *sub-total*							*75·0*	*85·0*	*191·6*	*344·0*
21. production reserves							6·0	6·5	15·4	26·0
22. total requirement							81·0	91·5	207·0	370·0
indigenous production										
23. natural rubber							45·6	50·5	72	100
24. synthetic rubber[2]							11·6	14·7	30	90
25. reclaimed rubber							6·6	9·7	25	70
imports (plus)										
26. natural rubber							15·0	16·4	5)	50
27. synthetic rubber							3·3	2·7	30	50
28. reclaimed rubber							2·1	0·1	—	—
29. total availability							84·2	94·1	207	360

Note : [1]Weight of fan belt and vee belt assumed at 0·2 kg. per unit ; and [2]Only one unit viz. synthetics and chemicals, in production. Additional capacity of 50000 tonnes envisaged during the Fifth Plan.
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Table MB. 28 : Material Balance : Chemical Pulp
India : 1964, 1965-66, 1970-71 and 1975-76

consuming industry/product	production of consuming product (thou. tonnes)				consumption norms tonnes/tonne	requirement of chemical pulp (thou. tonnes)			
	1964	1965-66	1970-71	1975-76		1964	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(8)	(10)
paper grade pulp									
1. paper and paper board. . . .	525	590	1050	2000	1·05	551	620	1100	2100
2. other miscellaneous						28	30	55	100
3. *sub-total (1+2)*						*579*	*650*	*1155*	*2200*
rayon grade pulp									
rayon and staple fibre									
4. viscose	70	74	90	150	1·1	77	81·4	99	165
5. acetate	1·8	2	12	15	0·80[1]	1·4	2	10	12
6. cellulose film	3·7	6	10	15	1·15	4·3	7	11	17
7. for admixture for manufacture of speciality paper						10	10	10	10
8. *sub-total (4 to 7)*						*92·7*	*100·4*	*130*	*204*
9. total requirement (3+8) . . .						671·7	750·4	1285	2404
indigenous production									
10. paper grade pulp . . .						591	650	1155	2200
11. rayon grade pulp . . .						—	48	110	200
12. imports						83	60·3	20	—
13. total availability of rayon grade pulp (11+12)						83	108·3	130	200

Note: [1] Cotton linters only.

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Table MB.29 : Material Balance : Electric Motors
India : 1965-66, 1970-71 and 1975-76

	annual increase in generating capacity (mkw)			norms kw(motors)/ kw capacity increase	requirement of electric motors (mkw)		
	1966-67	1971-72	1976-77		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
for additional capacity							
1. motors below 150 kw	2.0	2·3	3·6	1·2	2·40	2·80	4·25
2. motors above 150 kw	2·0	2·3	3·6	0·3	0·60	0·70	1·05
3. *sub-total*					*3·00*	*3·50*	*5·30*
for replacement[1]							
4. motors below 150 kw					0·22	0·26	0.72
5. motors above 150 kw					0·05	0·06	0·07
6. *sub-total*					*0·27*	*0·32*	*0·79*
7. total requirement					3·27	3·82	6·09
8. indigenous production					1·31	4·50[2]	6·30
9. motors below 150 kw					1·16	3·50	5·05
10. motors above 150 kw					0·15	1·00	1·25
11. imports (Rs. million)					35·0	—	..

Note : [1]Average life of motors below 150 kw assumed as 15 years and for 150 kw and above as 20 years ; and [2] Production target as indicated in the Draft Outline.

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Table MB.30 : Material Balance : Transformers
India : 1965-66, 1970-71 and 1975-76

	additions to generating capacity (million kw)			norms kva/increase[1] in generating capacity in kw	requirement of transformers (million kva)		
	1966-67	1971-72	1976-77		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. step-up transformers 66 kv and above	2·0	2·3	3·6	1·2	2·4	2·76	4·32
2. step-down transformers 66 kv and above	2·0	2·3	3·6	2·0	4·0	4·60	7.20
3. distribution transformers 33 kv and below	2·0	2·3	3·6	2·3	4·6	5·29	8·28
4. total requirement					11·0	12·65	20.80
5. indigenous production					4·4	12·00	21.00
6. imports (Rs. million)[2]					63·4	—	—

Note: [1]As adopted by the Planning Commission Technical Committee on Electrical Equipment; and [2]Import of transformers of different ratings for eleven months only.

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Table MB.31 : Material Balance : Ball and Roller Bearings
India : 1965-66, 1970-71 and 1975-76

consuming industry	production of consuming sector				consumption norms thou. nos. per unit	requirement of ball and roller bearings (thou. nos.)		
	unit	1965-66	1970-71	1975-76		1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. railway rolling stock	thou. nos	34	40	55	5·7	193·8	228	314
2. motor cars, jeeps & station wagons	thou. nos	35	70	120	28·0	980	1960	3360
3. commercial vehicles	thou. nos	35	80	150	42·0	1470	3360	6300
4. motor cycles and scooters	thou. nos	44	120	200	12·0	528	1440	2400
5. electric motors	thou. kw	1310	4500	6300	1·3	1700	5850	8190
6. electric fans	thou. nos	1360	3500	5500	1·5	2040	5250	8250
7. diesel engines	thou. nos	92	200	300	1·0	92	200	300
8. power driven pumps	thou. nos	238	400	500	2·0	476	800	1000
9. heavy machinery and mining machinery plant						200	1440	2900
10. crawler tractors	numbers	—	650	1200	0·07	—	45	84
11. tractors	thou. nos	5·6	35	120	42·0	235·2	1470	5040
12. textile machinery						1600	3220	3550
13. machine tools	Rs. million	292	1050	1600	1·9	555	2000	3050
14. sugar machinery	Rs. million	76	160	250	0·8	61	128	240
15. *sub-total*						*10131*	*27391*	*44978*
16. other users						506	1370	2250
17. total						10637	28761	47228
18. replacements						2127	5752	9446
19. allowance for stock building						128	345	567
20. total requirement						12892	34858	57241
21. domestic production						9000	30000	60000
22. imports						10000	5000	—
23. total availability						19000	35000	60000

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SECTION THREE

Developments in the Transport Sector

India : 1965-66, 1970-71 and 1975-76

Projections of Traffic : 1970-71, 1975-76

Railways

Motor Transport

Shipping and Ports

Section Three

Developments in the Transport Sector : 1965-66 to 1975-76

Introduction

1. The object of this note is to describe briefly the broad calculations underlying the programmes of transport development in the Fourth Plan. In the course of discussing the rationale and consistency of the targets laid down for 1970-71, the actual position in 1965-66 and the broad requirements for 1975-76 have also been given to present a picture of development over the decade 1965-66 to 1975-76. Only the major items of the programmes are covered and in the broadest terms.

2. The note is divided into following parts :

Projections of Transport Demand

(1) Goods traffic by rail
(2) Total goods traffic by all means of transport
(3) Passenger traffic by rail and road

Development of Railways

(1) General considerations governing railway planning
(2) Line-capacity works
(3) Requirement of rolling stock
(4) Programmes for manufacture of rolling stock
(5) Investment requirements

Appendix TD. A : Details of line-capacity works

Appendix TD.B : Progress in the substitution of mode of traction from steam to diesel/electric (1960-61 to 1975-76)

Appendix TD. C : Programme of manufacture of rolling stock

Development of Road Transport

(1) Growing role of road transport : investment and organisational requirements
(2) Demand and supply of motor vehicles

Shipping and Ports Development

Projections of Transport Demand

3. Planning Commission has set up a special organisation (Joint Technical Group on Transport Planning) to work out the traffic demand likely to be generated during the next decade as part of an integrated plan of development of the economy. The studies in hand aim at estimating the spatial distribution of the traffic load, showing major traffic-flows in respect of important commodities on different rail-lines and roads by 1970-71. It is hoped that the results of these extensive studies carried all over the country will enable, in due course, more efficient planning of transport facilities, having regard both to the temporal and spatial aspect of the problem.

4. The attempt made in this section to present broad estimates of traffic is necessarily on a far less ambitious scale. The estimates are, however, worked out in sufficient detail to show the likely growth of traffic, by different modes of transport and provide a basis for calculations of investment requirements on permanent facilities and rolling stock. These data are thus a useful supplement to the discussion on transport development in the Draft Outline of the Fourth Plan.

Goods Traffic

5. *Railway traffic* : The method used for the projection of goods-traffic demand on railways in terms of tonnes-originating is the projection of the observed ratios between production and movement (transport co-efficients) of important individual commodity groups corrected for known and anticipated changes in the processes of production and distribution. The transport coefficient for each major commodity group for 1970-71 and 1975-76 is determined on the basis of relevant data for the last decade, after introducing modifications where necessary, on the basis of studies made by the World Bank Team on Coal Transport, Joint Technical Group on Transport Planning and Perspective Planning Division of the Planning Commission. Traffic in 20 commodity groups, covering more than 80 per cent of total traffic, has been estimated accordingly. Traffic in railway materials is on the basis of indications given by the Railway Board. Traffic in other miscellaneous goods is taken as a ratio of the total of all other goods. Details are given in Table TD. 1. Production figures used are as adopted by the Planning Commission for the Fourth Plan, and as worked out in the Perspective Planning Division for the Fifth Plan. Where imports are substantial, these have been added so as to arrive at total quantity requiring movement.

6. The volume of traffic in terms of tonne-kilometres (which is a better measure of traffic) is then worked out by determining the 'length of haul' (or average lead) in respect of each commodity-group. For important commodities, the lead has been approximately estimated on the basis of above mentioned studies regarding origin-destination of major traffic flows. For other goods the present average lead is used. A small allowance of 2-3 per cent is given to allow for any possible increase in the leads of some commodities. Details are in Table TD. 2.

7. *Total traffic* : For purposes of projections of traffic requirements, total freight traffic has been divided into two categories—'long-distance' and 'feeder and local' traffic. The 'long-distance traffic' refers to the type almost exclusively carried by railways during first plan period. It includes all traffic by railways and coastal shipping, motor traffic over 100 kilometres and bulk movements by inland water transport. All other traffic is included under 'feeder and local traffic'.

8. Long-distance traffic in major commodity-groups is estimated on the basis of relevant transport co-efficients. (These co-efficients are, however, less precise than those for rail transport, as data for motor traffic is inadequate and for a few years only.) Long-distance traffic in other miscellaneous goods is taken as a ratio of long-distance traffic in major commodities. Similarly, feeder and local traffic is taken as a ratio of total long-distance traffic. These ratios are fixed on the basis of such information as is available.

9. Out of the total traffic thus estimated, traffic by railways as estimated earlier is subtracted in order to arrive at the share of traffic going to other means of transport. Traffic by means other than motor transport is very small and it is assumed that their share will continue to be insignificant in future as well. Making a rough estimate of such traffic, the rest of the traffic is allotted to motor transport. Details are in Table TD. 3.

10. A better estimate of traffic by road will be possible only when the studies being conducted by various Regional Transport Survey Organisations are completed. In the meantime only a rough estimate can be prepared. Surveys of motor transport made so far indicate a rate of growth of goods traffic of 13 to 14 per cent per annum. This observed trend is in line with the projected trend of goods traffic by motor transport made in PPD studies.

Passenger Traffic

11. *Railways* : Suburban and non-suburban passenger traffic in future has been estimated separately on the basis of rate of growth in the past (Table TD. 4). No allowance for increase in the past rate is given as motor transport is expected to carry a progressively increasing share of total passenger traffic in future.

12. *Motor transport*: Projections of traffic demand are made by studying the rate of growth in the past and allowing for some increase in it on account of higher rate of growth of population and per capita incomes. The rate of growth of traffic during the fourth and fifth plan periods is accordingly taken at about 8·5 and 10 per cent per annum respectively, as against 7 per cent in the past.

13. The growth of traffic during the period 1950 to 1975 is given in Table TD. 5.

Table TD. 1 : Volume of Goods Traffic on the Indian Railways
India : 1955-56, 1960-61 to 1965-66 (year-wise), 1970-71 and 1975-76

(thousand tonnes originating)

commodity	1955-56	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
coal									
1. production	38821	52620	56100	61548	66919	63990	68000	106000	158000
2. rail movement	35888	50396	53892	61441	64084	62694	68000	100700	150100
3. transport coefficient	92·4	95·8	96·1	99·8	95·8	97·9	100	95	95
iron ore									
4. production	5560	10680	12264	13356	14781	14898	24000	48000	75000
5. rail movement	4443	10516	11909	14335	15011	15334	18000	36000	56300
6. transport coefficient	79·8	98·4	97·0	107·4	101·5	102·9	75	75	75
manganese ore									
7. production	1609	1199	1236	1224	1104	1260	1562	3200	4900
8. rail movement	1400	1230	1250	1215	1158	1449	1484	2400	3700
9. transport coefficient	87·0	102·6	101·1	99·3	104·9	115·0	95	75	75
limestone and dolomite									
10. production	7590	16120	20650	18285	17507	17507	20900	44000	73000
11. rail movement	2000	5401	6662	7494	7064	7455	8987	15400	25500
12. transport coefficient	26·3	33·5	32·2	40·9	40·3	42·5	43	35	35
salt									
13. production	3027	3436	3470	3890	4540	4650	4900	8000	11000
14. rail movement	1887	1981	2222	2380	2313	2103	2205	4000	5500
15. transport coefficient	62·3	57·6	64·0	61·2	51·0	45·2	45	50	50
other ores									
16. production and imports	included	1797	2298	2604	2528	2612	3000	13000	21000
17. rail movement	under iron	624	765	958	883	882	1050	3900	6300
18. transport coefficient	ore	34·7	33·2	36·7	34·9	33·7	35	30	30

foodgrains									
19. production and imports	67553	86107	84533	82088	84799	94664	78800	120000	152000
20. rail movement	9187	12659	12233	12346	14198	13756	14184	18000	22800
21. transport coefficient	13·6	14·7	14·4	15·0	16·7	14·5	18	15	15
sugarcane									
22. production	60543	104127	99853	94470	104908	122127	121200	135000	229000
23. rail movement	3463	3237	3371	2885	2095	2572	2424	2700	4600
24. transport coefficient	5·7	3·1	3·3	3·0	2·0	2·1	2	2	2
oil seeds									
25. production	5734	6623	6958	7113	7038	8584	6140	10700	16000
26. rail movement	1794	1517	1334	1438	1539	1341	982	2100	3200
27. transport coefficient	31·3	22·9	19·1	20·2	21·9	15·6	16	20	20
raw cotton									
28. production and imports	831	1188	970	1111	1115	1114	850	1500	2200
29. rail movement	751	536	412	435	416	416	314	500	800
30. transport coefficient	90·4	45·1	42·4	39·1	37·3	37·3	37	35	35
raw jute									
31. production	762	723	1152	981	1113	1094	806	1600	2100
32. rail movement	520	644	766	932	832	661	484	1200	1600
33. transport coefficient	68·2	89·0	66·4	95·0	74·7	60·4	60	75	75
cement									
34. production	4559	7844	8245	8587	9355	9690	10800	20000	30000
35. rail movement	4022	6548	6708	6851	7250	7657	8640	15000	21000
36. transport coefficient	88·2	83·4	81·3	79·7	77·4	79·0	80	75	70
petroleum products									
37. production and imports	5384	7532	8485	9480	10583	9984	11000	20000	35000
38. rail movement	3377	4700	4985	5452	6090	6163	6820	12000	17500
39. transport coefficient	62·7	62·4	58·7	57·5	57·5	61·7	62	60	50

Table TD. 1 : Volume of Goods Traffic on the Indian Railways
India : 1955-56, 1960-61 to 1965-66 (yearwise) 1970-71 and 1975-76—*contd.*

(thousand tonnes originating)

commodity	1955-56	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
iron and steel including manufactures									
40. production and imports	2680	4542	4929	5504	6645	6851	6600	13900	22000
41. rail movement	3713	7588	8132	9439	10551	10597	10890	22900	36300
42. transport coefficient	138·5	167·0	165·0	171·5	158·8	154·6	165	165	165
fertilizers									
43. production and imports	included in	1494	1865	2973	[3039	2700	3400	12400	22000
44. rail movement	64	1394	1596	1963	2343	2348	2550	6200	11000
45. transport coefficient		93·3	85·5	66	77·1	87	75	50	50
sugar									
46. production	1892	3029	2714	2152	2569	3260	3400	4500	6800
47. rail movement	1357	1488	1460	1609	1474	1446	1496	2300	3400
48. transport coefficient	71·7	49·1	53·8	74·8	57·4	44·3	44	50	50
cotton manufactures									
49. production	900	993	1081	1080	1137	1219	985	1300	2000
50. rail movement	557	380	379	348	335	324	266	300	500
51. transport coefficient	61·9	38·2	35	32·2	29·4	26·5	27	25	25
jute manufactures									
52. production	1044	1084	1010	[1236	1289	1324	1302	1700	2000
53. rail movement	294	263	249	231	229	239	234	300	400
54. transport coefficient	28·2	24·2	24·6	18·6	17·7	18	18	18	18
paper and newsprint									
55. production and imports	323	445	516	510	592	617	700	1100	2000
56. rail movement	260	442	460	465	568	653	700	1000	1800
57. tansport coefficient	80·5	99·3	89·1	91·1	95·9	105·8	100	90	90

tea									
58. production	308	321	354	347	346	373	376	500	600
59. rail movement	262	250	241	204	219	184	184	300	400
60. transport coefficient	85·0	77·8	68·0	58·8	63·3	49·3	49	60	60
61 railway materials (excluding coal) .	10900	16990	14812	17186	21327	23053	21000	23000	27000
62. sub-total : rail movement	86875	128784	133846	149607	159979	161327	170894	270200	399700
63· percentage of total . .	75	82·4	83·4	83·7	83·7	83·2	83·2	88	88
64. other commodities : rail movement . .	29025	27453	26675	29164	31122	32516	34406	37800	55300
65. percentage of total . .	25	17·6	16·6	16·3	16·3	16·8	16·8	12	12
66. total traffic .	115900	156237	160521	178771	191101	193843	205300	308000	455000

Note : Figures for 1955-56 to 1964-65 are actuals as given by the Railway Board. Figures for subsequent years are estimates.

Table TD.2: Goods Traffic on the Indian

	1960-61 (actuals)			1964-65 (actuals)		
	tonnes originating (thousand)	average lead (km)	tonne-kms (million)	tonnes originating (thousand)	average lead (km)	tonne-kms (million)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. coal	50400	677	34114	62694	611	38328
2. iron ore	10515	263	2762	15334	258	3955
3. manganese ore	1230	546	671	1449	619	897
4. limestone and dolomite	5401	265	1431	7455	221	1653
5. salt	1981	824	1633	2103	1034	2174
6. other ores	624	344	215	882	358	315
7. foodgrains	12659	760	9620	13756	788	10858
8. sugarcane	3237	100	324	2572	100	257
9. oilseeds	1516	767	1162	1341	761	1021
10. raw cotton	534	817	436	416	1041	432
11. raw jute	645	327	211	661	417	276
12. cement	6548	372	2471	7657	431	3335
13. petroleum products	4700	545	2560	6163	625	3853
14. iron and steel manufactures	7588	697	5291	10597	829	8790
15. fertilizers	1394	800	1115	2348	800	1878
16. sugar	1488	714	1073	1446	600	870
17. cotton manufactures	380	1126	428	324	1632	528
18. jute manufactures	263	1120	295	239	1300	311
19. paper and newsprint	442	500	221	653	500	327
20. tea	250	800	200	184	800	147
21. railway materials	16990	105	1767	23053	101	2340
22. other miscellaneous goods	27456	717	19684	32516	739	24025
23. total	156237	561	87680	193843	549	106570

Note : [1] In the case of commodities marked asterik (*), the lead has been worked out with reference to expected movements Commission. In the case of other commodities, average lead as in 1964-65 has been used.

PPD/Sept. 1966.

Railways, India : 1960-61 to 1975-76.

1965-66 (likely actuals)			1970-71 (estimated)			1975-76 (estimated)		
tonnes originating (thousand)	average lead (km)	tonne-kms (million)	tonnes originating (thousand)	average lead (km) [1]	tonne-kms (million)	tonnes originating (thousand)	average lead (km)	tonne-kms (million)
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
68000	611	41548	100700	564*	56795	150100	564	84656
18000	280	5040	36000	291*	10476	56300	291	16383
1484	619	919	2400	580*	1392	3700	580	2146
8987	221	1986	15400	261*	4019	25500	261	6656
2205	1034	2280	4000	1034	4136	5500	1034	5687
1050	358	376	3900	358	1396	6300	358	2255
14184	788	11177	18000	788	14184	22800	788	17966
2424	100	242	2700	100*	270	4600	100	460
982	761	747	2100	761	1598	3200	761	2435
314	1041	327	500	1041	521	800	417	334
484	417	202	1200	417	500	1600	1041	1666
8640	431	3724	15000	434*	6510	21000	434	9114
6820	625	4263	12000	616*	7392	17500	616	10780
10890	829	9028	22900	829	18984	36300	829	30093
2550	800	2040	6200	600*	3720	11000	600	6600
1496	600	898	2300	600*	1380	3400	600	2040
266	1632	434	300	1632	490	500	1632	816
234	1300	304	300	1300*	390	400	1300	520
706	500	350	1000	400*	400	1800	400	720
184	800	147	300	800*	240	400	800	320
21000	101	2121	23000	101	2323	27000	101	2727
34406	739	25426	37800	739	27934	55300	739	40867
205300	554	113579	308000	552	165040 +4960 170000	455000	549	245241 +4759 25000

analysed in the studies made by the Joint Technical Group, World Bank Team on Coal Transport and P.P. Division of the Planning

Table TD. 3 : Total Goods Traffic by all means of Transport
India : 1970-71 and 1975-76

		tonnes originating (million)		average lead (km)	volume of traffic (billion tonne-km)	
		1970-71	1975-76		1970-71	1975-76
	(1)	(2)	(3)	(4)	(5)	(6)
1.	long-distance traffic	395	600		207	312
2.	by rail	308	455	550	170	250
3.	by motor transport	67	120	400	27	48
4.	by other means of transport	20	25	525	10	14
5.	feeder and local traffic (at 110 and 130 tonne-km per tonne of long-distance traffic)				43	78
6.	by motor transport				33	67
7.	by other means of transport				10	11
8.	total traffic				250	390
9.	by rail				170	250
10.	by motor transport				60	115
11.	by other means of transport				20	25

Table TD. 3·1 : Long-distance Traffic by all means of Transport
India : 1970-71 and 1975-76

		production (million tonnes)		transport coefficient (per cent)	volume of traffic (million tonnes originating)	
		1970-71	1975-76		1970-71	1975-76
	(1)	(2)	(3)	(4)	(5)	(6)
1.	minerals	222·2	342·9		185·8	283·7
2.	coal	106	158	99	104·9	156·4
3.	iron ore	48	75	100	48	75
4.	manganese ore	3·2	4·9	100	3·2	4·9
5.	limestone and dolomite	44	73	40	17·6	29·2
6.	salt	8	11	70	5·6	7·7
7.	other ores[1]	13	21	50	6·5	10·5
8.	agricultural products	268·8	408·3		35·4	48·3
9.	food grains	120	152	20	24	30·4
10.	sugarcane	135	231	4	5·4	9·2
11.	oil seeds	10·7	16	30	3·2	4·8
12.	raw cotton	1·5	2·2	90	1·4	2
13.	raw jute	1·6	2·1	90	1·4	1·9
14.	finished products	75·4	122·4		72	116·4
15.	cement	20	30	80	16	24
16.	petroleum products	20	35	65	13	22·8
17.	iron and steel and manufactures[1]	13·9	22	200	27·8	44
18.	fertilizers	12·4	22	70	8·5	15·4
19.	sugar	4·5	6·8	80	3·6	5·4
20.	cotton manufactures	1·3	2	80	1	1·6
21.	jute manufactures	1·7	2	30	0·5	0·6
22.	paper and newsprint	1·1	2	100	1·1	2
23.	tea and coffee	0·5	0·6	95	0·5	0·6
24.	railway materials (other than coal)				23	27
25.	other commodities				78·8	124·6
26.	total				395	600

Note : [1]Includes imports.

Table TD. 4 : Passenger Traffic by Rail
India : 1955-56 to 1975-76

	volume of traffic (billion passenger kms)			annual rate of growth (per cent)	
	suburban	non-suburban	total	suburban	non-suburban
(1)	(2)	(3)	(4)	(5)	(6)
1. 1955-56	8·2	54·2	62·4	7·7	4·0
2. 1960-61	11·8	65·9	77·7	7·5	4·2
3. 1964-65	15·8	77·7	93·5	7·5	4·0
4. 1965-66	17	81·0	98·0	7·0	4·0
5. 1970-71	23·7	98·3	122·0	6·5	4·0
6. 1975-76	32·5	120·5	153·0		

Table TD. 5 : Growth of Traffic
India : 1950-51 to 1975-76

	railways	motor transport	other means of transport	total
(1)	(2)	(3)	(4)	(5)
goods traffic				
1. 1950-51	44	6	8	58
2. 1955-56	60	10	9	79
3. 1960-61	88	17	10	115
4. 1965-66	114	33	13	160
5. 1970-71	170	60	20	250
6. 1975-76	250	115	25	390
passenger traffic				
7. 1950-51	67	26	—	93
8. 1955-56	62	38	1	101
9. 1960-61	78	56	2	136
10. 1965-66	98	80	3	181
11. 1970-71	122	120	5	247
12. 1975-76	153	195	10	358

Note : Goods traffic in billion tonne-kms and passenger traffic in billion passenger-kms.

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Development of Railways

14. The programme of development of railway facilities during the fourth plan period is related to the additional traffic-load likely to be generated during that period. Traffic estimates for 1970-71 have been worked out by taking into account the level of development in agriculture, mining, industry and other sectors of economy in 1970-71. The details of these calculations are given in Projections of Transport Demand. Accordingly, the increase in rail traffic in the Fourth Plan will be of the following order :

	goods traffic (billion tonne-kms)	passenger traffic (billion passenger kms)
1. traffic in 1965-66	114	98
2. traffic in 1970-71	170	122
3. additional traffic during fourth plan period	56	24

15. Railway planning is proceeding on the assumption that the role of Railways will hereafter be confined mainly to the carriage of bulk commodities over long distances, while small-quantity or moderate-distance traffic will be progressively taken over by motor transport. For the expeditious and efficient clearance of bulk movements, Railways will be running much heavier and speedier trains. Progressively a larger proportion of important commodities will be moved in full train-loads as through services from the originating points direct to destinations. Railway facilities are being planned to play this role; and significant changes in the methods of operation are being brought about to this end.

16. Increase in rail capacity is being brought about mainly through following measures : (1) increase in track-mileage through construction of new rail-lines, doubling of existing single lines, gauge-conversions and provision of additional loops; (2) further substitution of the mode of traction through large-scale dieselisation and electrification; (3) procurement of superior types of rolling stock by establishing capacities for the manufacture of diesel and electric locomotives and by converting most of the wagon-building capacity to production of higher-capacity bogie wagons; (4) strengthening of existing track, bridges and other structures, especially in conjunction with a heavy programme of renewals; (5) modernisation of the signalling system; (6) expansion and mechanization of marshalling yard facilities; (7) provision of additional crossing facilities, yards, etc.

17. While planning line-capacity works, it is necessay to keep in view the requirements over a longer period of time. The estimates of traffic load in 1975-76 are about 250 billion tonne-kms of goods traffic and 153 billion tonne-kms of passenger traffic. To cope with this increased traffic, additional line-capacity will be needed. The magnitudes involved are : construction of new rail lines—4000 kms; doubling of existing single lines—6000 kms; gauge-conversion—3000 kms; electrification—4500 kms and dieselisation—10000 kms.

18. This is the broad requirement over the next decade. The actual programme for the line-capacity works to be undertaken during the Fourth Plan is based on detailed consideration of volume and intensity of traffic and other priority needs of development.

Line capacity works during the Fourth Plan

19. *Doubling of existing single railway lines* : Studies made by the Railway Board and the World Bank Team on Coal Transport have established the necessity of doubling fully the track on the main routes connecting Bombay, Calcutta, Madras and Delhi (totalling about 6800 route-kilometres) partial doubling (of about 500 route-kilometres) on other heavy traffic routes and provision of additional lines in metropolitan city areas. A proper phasing of this full programme will be possible after detailed investigation regarding the spatial distribution of future traffic-flows has been completed.

20. The programme laid down now is as under :

(*a*) completion of carry-over schemes from Third Plan which will cover 1370 kms;

(*b*) starting of new schemes to cover about 3500 kms, out of which only 1730 kms may be completed by the end of 1970-71. The plan-provision of about Rs. 2320 million is considered inadequate for larger programme of construction. (Details of the schemes are in Appendix TD. A). The total double-line track on railway will be increased to about 13000 kms by the end of 1970-71.

21. *Conversion of metre-gauge to broad-gauge* : Due to heavy pressure of traffic, it has become necessary to convert certain MG lines to BG. The programme for the Fourth Plan consists of

(*a*) completion of carry-over schemes, covering 265 kilometres at a cost of Rs. 120 million ;

(*b*) starting new schemes of coverting 2080 kms estimated to cost Rs. 1300 million, out of which only 185 kms may be completed by the end of the Plan, with the plan-provision of Rs. 720 million. (Particulars of new schemes are given in Appendix TD. A).

22. *Electrification and dieselisation*: The Railways have initiated a programme of progressive substitution of steam traction by electric and diesel traction. The assumptions underlying it and progress envisaged during the next decade are given in Appendix TD. B.

23. Programme of electrification for the Fourth Plan is as follows :

(*a*) completion of carry-over schemes to cover 953 kms;

(*b*) starting new schemes to cover about 2100 kms, out of which only about 1150 kms may be completed during the plan-period, plan provision for this purpose is Rs. 990 million. (Details of new schemes are in Appendix TD. A).

The total route-kilometres electrified will be about 4500 by the end of the Fourth Plan.

24. The programme of dieselisation will cover about 6700 route-kilometres on broad-gauge and 7300 on metre-gauge by the end of the plan-period, representing more than double the coverage at the end of the Third Plan.

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25. *Construction of new railway lines* : The policy is to keep the programme limited to serve the needs of heavy industries and mineral projects, export of mineral ores and strategic lines, with some provision for general development and opening up of selected backward areas. Construction of any new line is to be undertaken only after a careful cost-benefit analysis and evaluation of alternative possibilities of developing road transport for the purpose.

26. Within this broad framework of policy the programme drawn up for the Fourth Plan comprises

(*a*) completion of the carry-cover schemes of construction of new railway lines from Third Plan, which will cover 1775 kilometres and cost about Rs. 1000 million;

(*b*) starting new projects to cover about 1500 kilometres, out of this only about 425 kilometres may be completed by 1970-71. The total cost of these schemes is estimated at Rs. 1580 million, but expenditure in the Fourth Plan will be limited to Rs. 610 million. Particulars of the new schemes are given in Appendix TD.A.

27. *Track-renewals* : Provision is made to cover replacement demand of the permanent way, the welding of rails and additional ballast required to bring the road-bed up to standard consistent with high densities of traffic on main and other important lines. The programme consists of 12000 kilometres of primary rail-renewals and 20000 kilometres of primary sleeper-renewals, besides extensive secondary renewals in yards, siding and ancillary lines with materials released from main track. A provision of Rs. 2600 million has been made for this purpose.

28. *Signalling and safety works* : Adoption of modern signalling techniques and safety devices will be intensified during the fourth plan period. The main features of the programme are expansion of centralised traffic control to 1200 kilometres of track and automatic train control devices to 650 kms. Provision made on this account is about Rs. 600 million.

29. *Other line-capacity works* : A provision of about Rs. 1330 million has been made on this account. The main items of this programme are : construction of yards for new refineries; fertilizer plants and cement factories; expansion of yards for steel plants; remodelling and expansion of major transhipment points; provision of arterial sidings for industries in big industrial centres; bye-passes and fly-over lines in congested towns; installation of cranes and weigh bridges; provision of goods sheds and depots; provision of passenger stations and terminals etc.

Requirement of rolling stock

30. The railways had some reserve capacity for goods traffic (3 to 4 per cent) at the end of the third plan period. The procurement programme for rolling stock during the fourth plan period aims at maintaining this reserve capacity by the end of Fourth Plan as well so as to serve as a cushion.

31. Estimates of additional rolling stock requirements during the fourth plan period have been worked out below on the basis of aggregate traffic to be carried out by different types of rolling stock and the utilization co-efficients (average volume of traffic carried per unit per annum) for them. Utilization co-efficient for each category of rolling stock has been determined by taking into account past trends in performance, and allowing for any change in it, on the basis of studies made by the World Bank Team on Coal Transport and indications given by the Railway Board. A gauge-wise and traction-wise break up of traffic potential in 1965-66 and 1970-71 is given in Appendix TD. B which provides the basis for these calculations.[1]

[1]These calculations have been independently made in the PP Division. The total estimates of rolling stock arrived at are in line with the figures provided in the Railway Plan, which however does not furnish detailed basis for their calculation.

32. As regards replacement requirements, the policy is to accelerate the rate of replacement so as to eliminate most of the over-aged stock by the end of the fifth plan period. Accordingly, during the interim period of the Fourth Plan, about 1700 steam locomotives, 60000 wagons and 4000 passenger coaches are proposed to be retired. In calculating requirement of new stock to replace the retiring stock, it has been assumed (as stated in the 'Coal Transport Study') that one new unit is equivalent to two retiring units.

33. *Freight wagons (in terms of 4-wheelers)* : Additional capacity for freight traffic to be created in the fourth plan period will be about 56 billion tonne-kilometres. Taking the volume of traffic annually carried by a broad-gauge wagon as 450000 tonne-km and by a metre-gauge wagon as 260000 tonne-km, the requirement of additional wagons will be about 134000. Besides, about 30000 wagons will be required to replace 60000 wagons to be retired. The total wagon requirement thus comes to about 164000 (The actual provision made is 163250). Most of these (about 80 per cent) will be higher-capacity bogie wagons.

34. *Passenger stock* : The total additional traffic to be catered for by ordinary 'passenger carriages' (other than EMU and rail-cars) during the fourth plan period will be about 17 billion passenger-kilometres. This will require about 4850 carriages, by taking average annual performance of a carriage as 3·5 million pass-km. Requirment of 'other coaching vehicles' will be about 1450 (at 30 per cent of carriages). Besides, about 2000 carriages and other vehicles will be needed to replace 4000 units to be retired. Thus, the additional ordinary coaching stock required for the fourth plan period will be about 8300 units (Actual provision made is 8225).

35. Passenger traffic in electrified suburban areas around Bombay, Calcutta and Madras will be catered for by Electric Multiple Unit stock. About 700 additional units will be required in the fourth plan period to perform about 7 billion additional pass-kms. Besides, 157 units are being provided for replacement purposes.

36. 200 rail-cars will have to be added during the fourth plan period mostly to run short-distance services.

37. *Electric locomotives* : A capacity to carry about 45 billion tonne-kilometres of goods traffic and 13 billion passenger-kilometres of non-suburban passenger traffic by electric traction will be developed by 1970-71 on broad-gauge lines. Taking the average annual performance of an electric goods locomotive as 65 million tonne-kms and of a passenger locomotive as 45 million pass-kms, the requirement of locomotives works out to 980. Besides, a few shunters and some metre-gauge locomotives to serve a small electrified line will be needed, which may number about 25 (Most of the shunting work on electrified lines will, however, be done through diesel or steam shunters). As about 400 locomotives are likely to be available by the end of Third Plan, additional locomotives to be provided during the Fourth Plan will be 605.

38. *Diesel locomotives* : Capacity for goods traffic by diesel traction in 1970-71 will be about 61 billion tonne-kilometres on broad-gauge and 11 billion tonne-kilometres on metre-gauge. The requirement of locomotives will be about 1410 locomotives, as a BG loco may annually carry 60 billion tonne-kms and an MG loco 28 billion tonne-kms. In respect of passenger traffic diesel traction will have a minor role and only a few trains may be run by diesel locomotives. About 85 locomotives may be required to perform about 3 billion pass-kms. Requirement of shunters will be about 150 (at 10 per cent of haulage locos). Besides, about 55 locomotives need to be placed on narrow-gauge mostly to replace steam locomotives being retired. Thus the total fleet of diesel locomotives in service at the end of Fourth Plan will have to be about 1700. Subtracting the number on line by the end of Third Plan. the addition during the fourth plan period will be 982.

39. *Steam locomotives* : The requirement of additional passenger traffic to be catered for by steam traction in Fourth Plan may be about 140 locomotives for carrying 3 billion additional passenger kilometres (a locomotive performing annually about 22 pass-kms); besides, 150 new units will be required for replacing 300 retiring units.

40. As regards goods locomotives, about 1100 units may be retired during fourth plan period equivalent to about 550 new units. It is proposed to add only 300 new units. This will result in reducing the goods traffic carried by steam traction in 1970-71 by 5 billion tonne-kms than the capacity in 1965-66. This has been taken into account in providing capacities by electric and diesel traction.

41. The number of shunters and departmental vehicles to be retired during the fourth plan period will be about 300. The loss on account of these has been taken into account in fixing targets for acquisition of diesel locomotives.

42. *Programme of manufacture of rolling stock* : Capacities are being established to provide indigenously all the rolling stock requirements. But some components will have to be obtained from abroad on a progressively diminishing scale. The pace of electrification/dieselisation has been determined by taking into consideration capabilities of indigenous manufacture. By the end of the fourth plan period capacity to produce 150 electric locomotives, 250 diesel locomotives, 40000 wagons (in terms of 4-wheelers) and 2200 coaches will have been established in the country.

43. While fixing these targets, it is useful to keep in view the requirements over a longer time-horizon. Broad order of capacities required by 1975-76 will be : (1) electric locomotives —275; (2) diesel locomotives —375; (3) wagons—55000; and (4) coaches—2500.

Railways Manufacturing Programme

44. The Railways aim at achieving self-sufficiency in respect of their requirements of rolling stock and other equipment though some components will have to be imported from abroad during the fourth plan period. A part of the requirements will be manufactured in the private sector and a part in Railways' own projects (see Appendix TD.C).

45. The Railway's own manufacturing programme is briefly indicated below:

(1) *Chittaranjan Locomotive Works* : The production of BG electric locomotives will be increased from 32 in 1965-66 to 150 in 1970-71. The production of steam locomotives will be curtailed from 137 in 1965-66 to 47 in 1970-71. This programme will fully satisfy the demand for the fourth plan period.

(2) *Diesel Locomotive Works, Varanasi* : Manufacture of BG diesel locomotives will be stepped up from 39 in 1965-66 to 150 in 1970-71, which will meet the full demand.

(3) *MG Diesel Locos* : A scheme to establish capacity to build 70 MG diesel locomotives either at Varanasi or Chittaranjan is under consideration. Full production, however, may not be possible by 1970-71 and in that case the shortage may have to be covered either through imports or by cutting down the programme of retirement of MG steam locos.

(4) *Diesel Shunters and MG Locos* : A capacity to build 30 units will be established in railway workshops by the end of the plan period.

(5) *Integral Coach Factory, Perambur* : A capacity to manufacture 700 fully furnished coaches per annum will be developed. This will include production of electric multiple units and rail-cars also.

(6) *Production of wagons and coaches in Railway workshops* : The present production capacity for wagons and coaches is about 12000 and 500 respectively per annum. A scheme to set up a new wagon-building factory, so as to shift this work from workshops and relieve them for other work, and increase the production to 15000 units per annum, has been proposed. But the scheme may not go through during the Fourth Plan.

(7) *Signalling equipment* : A factory is being set up to meet railway demand in this regard.

(8) *Steel Foundry* : A foundry is being set up to fulfil railway requirements, the production reaching 10000 tonnes per annum towards the end of the Plan.

46. For the above programmes and for the normal requirements of plant and machinery in various workshops, a provision of about Rs. 800 million has been made.

Investment requirements

47. For the above programmes and for other miscellaneous items including staff welfare, a gross outlay of Rs. 20940 million has been provided in the Railway Plan. The details are shown in table below. After allowing for the amount of Rs. 6840 million to be derived from the Railways Depreciation Reserve Fund, the provision in the Plan is Rs. 14100 million.

Table TD-6 : Investment Requirement for Railways during the Fourth Plan Period

	physical programme		cost per unit (Rs. thousand)	total cost (Rs. million)
	unit	no./vol.		
(1)	(2)	(3)	(4)	(5)
1. *rolling stock*				4230
2. electric locomotives	number	605	1250	756
3. diesel locomotives	number	982	1470	1444
4. steam locomotives	number	590	460	271
5. wagons (in terms of 4-wheelers)	number	163250	22·6	3689
6. passenger coaches	number	8225	160	1316
7. electric multiple unit stock	number	857	500	428
8. rail cars	number	200	880	176
9. other miscellaneous items		—	—	150
10. *line capacity works*				9670
11. doubling of single rail-lines	Km	3100	730	2329
12. electrification	track-Km	5400	183	990
13. construction of new rail lines	Km	2200		1610
14. conversion of MG to BG	Km	450		720
15. track-renewals				2000
16. other line-capacity works (expansion of marshalling yards, additional crossing facilities, loops, etc.)				1330
17. *other miscellaneous schemes*				3140
18. workshops -plant and machinery				800
19. signalling and safety works				600
20. bridge-work				280
21. staff quarters and welfare				650
22. users' amenities				200
23. investment in road services				30
24. other electric and structural works				230
25. inventories				350
26. *total gross investment*				20940
27. amount to be spent from Depreciation Reserve Fund				6840
28. plan provision				14100

Note : Railway Board estimate of gross investment requirement is higher by about 5 per cent. On the assumption that certain economies in expenditure will be possible and the average lead of traffic might show a slight reduction, the provision in the Plan has not been changed.

Appendix TD. A—Section Three

Particulars of Schemes of Line Capacity Works

Table TD. A. 1 : Routes on which Doubling of Track is proposed to be provided in the Fourth Plan

trunk route	route kms. already doubled or where doubling is in progress	route kms. remaining to be doubled
(1)	(2)	(3)
1. Delhi-Madras	1040	1130
2. Madras-Calcutta	1445	588
3. Bombay-Delhi (Western Railway)	954	428
4. Madras-Bombay	336	933
5. Total	3775	3079

Note : Other routes proposed for partial doubling are :

1. Jalarpet-Bangalore
2. Erode-Cochin
3. Raipur-Vizianagram
4. Anuppur-Bilaspur
5. Chandrapura-Bondamunda
6. Kiul-Sainthia-Khana (Sahibganj Loop)
7. Gomoh-Barakakana-Garhwa Road
8. Mughalsarai-Saharanpur (viz. Varanasi, Lucknow)
9. Delhi-Saharanpur
10. Katni-Chheoki
11. Pilot sections in coalfields areas
12. Additional lines in major cities

Table TD.A. 2 : New Schemes of Conversion to be Started in the Fourth Plan

Section	length (km)	estimated cost (Rs. mil.)	main purpose to be served
(1)	(2)	(3)	(4)
1. Hospet-Londa : (Miraj-Londa-Goa)	650	420	for export of iron ore from Bellary/Hospet and for connecting Goa with hinterland
2. Guntakal-Dharmavaram-Bangalore	280	170	for general development purposes
3. Barabanki-Gonda-Gorakhpur	242	150	for general development purposes
4. Samastipur-Raxaul-Narkatiyaganj	240	150	
5. Tirchirapalli-Madurai-Tuticorin	306	190	for general development purposes
6. Arrah-Sasaram	105	220	to improve the transport facilities in the areas at present served by privately owned narrow gauge line
7. Howrah-Amta-Sheakele	70		
8. Shahdara-Saharanpur	149		
9. Dehri-Rohtas	38		
10. total	2080	1300	

Table TD.A. 3 : New Schemes of Electrification to be Started in the Fourth Plan

section	route (kms)	track (kms)	estimated density of traffic in terms of trailing tonne-km per route-km—per annum (million)	
			1965	1970-71
(1)	(2)	(3)	(4)	(5)
1. Kanpur-Tundla	227	542	21	26
2. Tundla-Delhi	204	476	11	18
3. Rourkela-Durg	453	1100	15	28
4. Itarsi-Bhusaval	301	700	21	29
5. Madras-Vijayavada	429	1160	14	26
6. Virar-Sabarmati	442	1125	20	32
7. Madras-Arkonam	69	203		

Table TD. A. 4 : New Lines under Consideration for the Fourth Plan

section		length (km)	estimated cost (Rs. million)	main purpose to be served
(1)		(2)	(3)	(4)
1. Kathua—Jammu	BG	88	120	to provide rail link to Jammu
2. Tirunelveli—Nagercoil—Trivandrum—Cape Camorin	MG	184	120	for general development purposes
3. Mael—Ramgarh—Marapahari	BG	43	40	for coalfields and industrial complex
4 Nayagarh—Daitari—Paradeep	BG	320	320	to provide rail link to Paradeep Port for export of iron ore
5. Extension of Diva—Panvel—Apta line to Dasgaon	BG	112	112	for development of Konkan area
6. Extension from Dharamnagar to Kumarghat (Tripura State)	MG	32	32	to provide rail link to Tripura State
7. New line on South Bank of the Brahmaputra from Gauhati to Panchratna	BG	160	160	to extend broad gauge link upto Gauhati.
8. Bonakallu to Jaggayapet	BG	24	24	to serve new cement plant
9. Bailadilla to Lanjigarh Road or Kazipet or Jagdalpur to Dhalli—Rajhara	BG BG	288 230	350	for export of iron ore from Bailadilla beyond 6 million tonnes
10. Dimapur (Manipur Road) to Imphal	MG	240	300	to provide rail link to Manipur State
11. total		1491	1578	

Appendix TD. B—Section Three

Electrification and Dieselisation of Indian Railways

1. The traffic load on the Railways has been fast increasing in the past and is expected to be more than doubled during the next decade. Moreover, a larger and larger proportion of traffic consists of bulk movements. It has become necessary, therefore, to run faster and heavier trains for expeditious clearance of bulk movements so as to avoid excessive recourse to costly line-capacity works. It is more economical and convenient to run such trains by diesel and electric locomotives than by steam locomotives. The railways have, therefore, embarked upon a programme of progressive substitution of steam traction by electric and diesel traction.

2. The pace of this substitution is necessarily limited by the following factors : (1) capability of establishing capacities for manufacturing the requisite stock of diesel and electric locomotives and other accessories so as not to increase the dependence on imports excessively; (2) ability of the Railway administration to execute the necessary electrification works on a more intensive basis ; (3) necessity of continuing the use of the existing large stock of steam locomotives (about 10000); and (4) availability of electric power and diesel oil at economic rates.

3. Keeping in view the above constraints, the outlook for electrification and dieselisation of the Railways during the next decade is indicated in the accompanying Table TD.B.1.

4. The basic assumptions underlying the estimates of the Table are as follows :

(1) Production of steam locomotives will be progressively curtailed from 203 units in 1965-66 to 47 units in 1970-71, as provided in the Fourth Plan, and assumed to stop altogether in the fifth plan priod. The retirement of old steam locomotives will be effected at a faster rate than in the past so that most of the over-aged locomotives (above 40 years age) will be eliminated by 1975-76. The existing stock will continue to be utilized, though for a minor role only.

(2) All additional requirements will be met through diesel and electric locomotives. Sufficient capacities to manufacture these will be established in the country.

(3) Electric traction is more economical than diesel traction only when traffic density is very heavy; otherwise, diesel traction is superior on account of its mobility. Electrification will, therefore, be confined to very high-density main traffic routes mostly on broad gauge (high-density here means above 20 million trailing tonne-kms per route-km—per annum). Electrification will proceed at the rate of about 400-500 route-kilometres per annum so that route-kilometrage electrified will be 4500 by the end of the fourth plan period and 6700 by the end of the fifth plan period.

(4) All traffic on electrified routes, estimated on the basis of likely traffic-densities on these routes in 1970-71 and 1975-76, will be carried by electric traction. Traffic in suburban areas around metropolitan cities will be catered for by Electric Multiple Unit stock. The remaining passenger traffic and all goods traffic will be carried by electric locomotives.

(5) Useful steam locomotives on line at any time will continue to be used, preference
1970-71 and 1975-76 has been estimated on the basis of the net decrease in the

(6) The residual traffic (after determining the traffic by electric and steam locomo
traffic in the first instance. Most of the additional shunting requirements will be
movement of short distance passenger traffic, rail cars will be used.

Table TD.B.1 : Progress of Substitution of

India : 1960-61

type of traffic/gauge	1960-61 (actuals)				1964-65 (actuals)			
	steam	diesel	electric	total	steam	diesel	electric	total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
goods traffic								
1. broad gauge .	65·2	7·2	1·3	73·7	46·4	29·0	13·2	88·6
2. metre gauge .	13·5	0·2	—	13·7	14·3	3·4	—	17·7
3. narrow gauge .	0·3	—	—	0·3	0·3	—	—	0·3
4. total . .	79·0	7·4	1·3	87·7	61·0	32·4	13·2	106·6
passenger traffic								
5. broad gauge .	44·2	0·1	9·8	54·1	51·1	0·2	14·5	65·8
6. metre gauge .	21·8	—	0·5	22·3	25·6	0·2	0·6	26·4
7. narrow gauge .	1·3	—	—	1·3	1·3	—	—	1·3
8. total . .	67 3	0·1	10·3	77·7	78·0	0·4	15·1	93·5
9. total traffic[2] .	253·5	14·7	10·1	278·3	231·8	64·3	34·9	331·0
10. percentage of traffic carried by each mode of traction	91·1	5·3	3·6	100·0	70·0	19·4	10·6	100·0

Note : Goods traffic in billion net tonne-km ; passenger traffic in

[1]These are the capacities ; actual traffic would be somewhat lower as given in Table TD. 2 ; and [2]This is the total of goods converted to gross tonne-kilometres on the basis of actual ratios between net tonne-km and gross tonne-km. Similarly, passenger

being given to passenger services. The traffic carried by steam locomotives in number of steam locomotives in each plan period.

tives) will be carried through diesel traction. Priority will be given to goods met through diesel shunters, as these are more economic for that work. For

Mode of Traction on Indian Railways

to 1975-76

1965-66 (actuals)				1970-71 (estimated)				1975-76 (anticipated)			
steam	diesel	electric	total	steam	diesel	electric	total	steam	diesel	electric	total
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
47·9	32·5	17·7	98·1	44	61	45	150	33	87	160	220
14·6	4·5	0·1	19·2	14	11	—	25	12	23	—	35
		included under MG				included under MG				included under MG	
62·5	37·0	17·8	117·3[1]	58	72	45	175[1]	45	110	100	255[1]
52·5	0·8	15·7	69·0	54	2	32	88	50	10	53	113
27·8	0·2	1·0	29·0	31	1	2	34	30	8	2	40
		included under MG				included under MG				included under MG	
80·3	1·0	16·7	98·0	85	3	34	122	80	18	55	153
237·9	73·2	44·4	355·5	233·9	147·6	110·6	492·1	199·0	239·2	230·5	668·7
67·0	20·6	12·4	100·0	47·5	30·0	22·5	100·0	29·8	35·8	34·4	100·0

billion pass-kms and total traffic in billion gross tonne-km ;

and passenger traffic measured in gross tonne-kilometres— net tonne-kilometres of goods traffic by each type of traction were kilometres were converted to gross tonne-kms. as per actual ratio in 1964-65.

Appendix TD.C. Section Three

Table TD.C. 1 : Production of Railway Rolling Stock during the Fourth Plan Period

	electric locomotives	steam locomotives		diesel locomotives			freight wagons (in terms of 4-wheelers)	passenger coaches (including EMU and rail-cars)
		BG	MG	BG	MG	shunters		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
manufacturing units	Chittarajan Works	Locomotive (Railways)	Tata E.L. Co. (Private)	Diesel Loco Works, Varanasi (Railways)	location not decided (Railways)	Railway workshops	Rly. workshops (30%) private firms (70%)	I.C. Factory Perambur; Rly. workshop(60%) other firms (40%)
production								
1966-67 . .	75	120	60	88	—	—	33000	1500
1967-68 . .	110	95	70	110	40	10	34000	1800
1968-69 . .	120	78	70	120	70	30	35000	2000
1969-70 . .	150	50	—	140	70	30	38000	2000
1970-71 . .	150	47	—	150	70	30	40000	2000
total (Fourth Plan)	605	390	200	608	250[1]	100+25[1] NG	180000[2]	9300

Note : [1]These schemes for the production of MG diesel locos at Varanasi or Chittaranjan and NG diesel locos in Railway workshops have been proposed for the Fourth Plan. However, it is now felt that actual production during Fourth Plan may fall short of planned targets; the shortfall will have to be covered either through imports or through curtailment of programme of retirement of steam locomotives ; and [2]The programme covers, besides railway requirements, needs of other consumers and export.

PPD/Sept. 1966.

Development of Road Transport

48. A number of Committees of Experts have in recent years stressed the importance of the role of motor transport and have recommended policies and measures conducive to its accelerated growth. The aim of planning is to use in the most effective and efficient manner possible the resources devoted to provision of transport services. Planning of the transport facilities is proceeding with the objective of securing the use of different means of transport on the basis of the relative cost and convenience of their services. This has lead to the decision that the operation of railways should be confined mainly to bulk or very long distance movements, while small-quantity, moderate-distance traffic should be progressively taken over by motor transport.

49. The object of this note is to present certain quantitative magnitudes relating to the demand and supply position of road transport. It deals with estimates of requirement of commercial vehicles during the Fourth and the Fifth Plans, the manufacturing capacity and the annual output of vehicles to meet the needs fully from domestic production, calculations of estimated investment on motor transport, and certain organisational and financial issues.

Vehicle requirement : (Table TD. 7)

50. The goods and passenger traffic to be carried in 1970-71 by commercial motor transport is estimated at 60 billion tonne-kilometres and 120 billion passenger-kilometres respectively. To carry this traffic, about 425000 goods trucks and 100000 passenger buses will have to be in service in 1970-71. As the number of vehicles on road in 1965-66 is about 250000 trucks and 70000 buses, the net addition to vehicle fleet during the fourth plan period should be 175000 trucks and 30000 buses. In addition, replacement requirements will amount to about 85000 vehicles on the assumption that about 25 per cent of truck-fleet and 30 per cent of bus-fleet in 1965-66 will be retired during the fourth plan period. Thus, the gross requirement of additional vehicles during 1966-71 will be 290000. The programme of vehicle manufacture is designed to step up production from about 40000 in 1966-67 to 80000 in 1970-71. During the Fifth Plan, a gross addition of about 600000 vehicles will be needed and the production will have to be stepped up to 150000 by 1975-76.

Provision of capital

51. The net investment required for the motor transport sector during the fourth plan period is estimated at about Rs. 8950 million (Table TD.8). A part of the vehicle requirement will be met through private carrier trucks, owned by industrial establishments, project authorities, etc., investment for which would form part of investment under those projects. For the remaining, capital requirements will amount to about Rs. 7000 million. Of this, about Rs. 680 million have been provided in the public sector for State-owned road transport undertakings. The remaining amount has to be subscribed by private motor operators.

52. Raising resources of this order is likely to pose a problem for these operators, who are largely small size firms without adequate resources. Arrangements are, therefore, proposed to be made to provide sufficient credit facilities from various credit institutions. A special committee has been set up to suggest ways and means for doing this. The industry is at present mostly run by small operators who are not properly organised to fulfil the task. Greater attention has to be paid to bring about better organisation through formation of viable and efficient organisations. Formation of larger associations, companies and cooperative societies of operators, provision of proper booking and repair/maintenance facilities, liberal grant of permits to run vehicles, simplification of procedures for regulation of industry and improvement of taxation procedures so as to avoid multiple or vexacious taxation are some of the further measures to cope with the problem. Special attention is to be paid to bring about a rational development of motor transport in different regions. A number of surveys and studies have been initiated through a special Joint Technical Group on Transport Planning to work out precise estimates of requirements of each region.

Table TD. 7 : Requirement of Commercial Vehicles India : 1970-71 and 1975-76

	volume of traffic (billion tonne-km/pass.-km)		traffic carried by a vehicle per annum (thou. tonne-km/pass.-km)	no. of vehicles in service (thousands)	
	1970-71	1975-76		1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)
1. long-distance traffic	27	48	300	90	160
2. feeder and local traffic	33·5	67	100	335	670
3. total goods traffic	60·5	115		425	830
4. passenger traffic	120	195	1200	100	160
5. total				525	990

Note: 1. Annual rate of growth of traffic during the fourth and the fifth plan periods is estimated at 12·5 and 14 per cent respectively in respect of goods and 8·5 and 10 per cent in case of passengers.

2. Vehicle-utilization assumed is as follows:

	average capacity	annual kilometre	load factor per cent
goods truck in long-distance traffic	7 tonnes	60000	70
goods truck in feeder and local traffic	4 tonnes	40000	65
passenger bus	40 seats	45000	66

3. Production of commercial vehicles (in thou. nos.) :

1966-67	1967-68	1968-69	1969-70	1970-71	total Fourth Plan	1975-76	total Fifth Plan
40	50	60	70	80	300	150	600

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Table TD. 8 : Net Investments Required for Commercial Motor Transport during the Fourth Plan Period

(1)	goods (2)	passenger (3)	total (4)
1. total traffic in 1970-71 (billion) (goods: tonne-km; passenger : pass.-km)	60	120	
2. traffic carried per vehicle per annum (thou.)	140	1200	
3. no. of vehicles required to be in service in 1970-71 (thou. units)	425	100	525
4. no. already on road in 1965-66 (thou. units)	250	70	320
5. net addition of vehicles required during fourth plan period (thou. units)	175	30	205
6. average cost per vehicle (Rs. thou.)	40	55	
7. total cost of vehicles (Rs. million)	7000	1650	8650
8. provision for ancillary facilities at 10 per cent of cost of vehicles in case of passenger buses and 2 per cent in respect of goods trucks (Rs. million)	140	165	305
9. total net investment in motor transport (Rs. million)	7140	1815	8955
10. *deduct*: 25 per cent for private carrier trucks owned by industries, project authorities etc., and 5 per cent for private buses, investment for which is included elsewhere (Rs. million)	1785	90	1875
11. plan provision (Rs. million)	5355	1725	7080

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Shipping and Ports Development

Shipping

53. The objective of the shipping programme is to enable Indian shipping to carry 100 per cent of coastal trade and 50 per cent of overseas trade by 1975-76. This requires the raising of the Indian-owned shipping tonnage to 5 million GRT. Accordingly the shipping tonnage in operation is proposed to be increased from 1·5 million GRT in 1965-66 to 3 million GRT in 1970-71 and 5 million GRT in 1975-76.

54. Including 0·2 million GRT required for replacement purposes, gross acquisition of shipping tonnage during the fourth plan period will be 1·7 million GRT. Of this only 12 per cent will be indigenously built, while the rest will be purchased abroad, partly second-hand and mostly on hire purchase basis.

55. The total cost of this programme will be about Rs. 2680 million. But, as most of the ships will be purchased on deferred payment basis, only the payments falling due in the fourth plan period have been taken into account. These have been estimated at Rs. 1360 million (including carry-over payments from the Third Plan). Besides, Rs. 40 million will be required for other miscellaneous schemes, such as marine training, assistance to sailing vessels etc. Against these requirements, a provision of Rs. 900 million has been made in the Fourth Plan. The remaining amount is expected to be available through Shipping Development Fund and resources of the Shipping Corporations. Details are given in Table TD. 9.

Ports

56. Development of port facilities is related to the requirements of coastal and overseas (import-export) traffic. Most of this traffic is concentrated at a dozen major ports. Requirement of expansion of capacities of these ports have been studied by a special working group of Planning Commission, in consultation with port authorities. It is assessed that the handling capacity of these ports will have to be increased from 50 million tonnes in 1965-66 to 80 million tonnes in 1970-71 and 110 million tonnes in 1975-76. Programme of development during the Fourth Plan includes: expansion of navigational and ship-repair facilities; provision of additional cargo-handling equipment, floating crafts and cranes and other port-equipment; expansion of workshop facilities; provision of transit sheds and ware-houses; other miscellaneous items, including staff welfare schemes. Total cost of the programme is Rs. 2640 million, port-wise distribution being as follows:

port	cost of programme (Rs. million)	port	cost of programme (Rs. million)
1. Calcutta	259	7. Kandla	104
2. Haldia	375	8. Goa	277
3. Bombay	489	9. Paradeep	55
4. Madras	281	10. Tuticorin	186
5. Cochin	190	11. Mangalore	203
6. Vizagapatnam	223		

57. The actual expenditure during the Fourth Plan will, however, be limited to Rs. 2170 million. Out of this, Rs. 720 million will be found through ports' own resources and Rs. 1450 million are shown as plan provision.

58. Besides, minor programmes at other ports and light-houses will cost Rs. 320 million.

Table TD. 9 : Shipping Programme and Investment Requirement during the Fourth Plan Period

(amount in Rs. million; tonnage in thou. GRT)

programme	tonnage/amount
(1)	(2)
1. tonnage in operation in 1965-66	1500[1]
2. tonnage in operation in 1970-71	3000[1]
3. net addition during Fourth Plan	1500
4. *add*: replacement requirements	200
5. gross acquisition during Fourth Plan	1700
of which :	
6. indigenously built	200
7. purchased abroad	1500
8. average cost per GRT	1575
9. total cost of programme for acquisition of ships	2678
10. expenditure on miscellaneous schemes (marine training, etc.)	40
11. funds required during fourth plan period	1400
of which :	
12. payments for indigenous ships (at 95 per cent of total cost)	300
13. ships purchased abroad – down payments (at 10·75 per cent of cost)	300
14. ships purchased abroad – deferred payments	340
15. carry-over commitments from Third Plan	420
16. expenditure on miscellaneous schemes	40
17. provision of funds financed from provision in the Fourth Plan	900
18. Shipping Development Fund	200
19. resources of shipping corporation	300

Note: [1] With outstanding orders of 500000 GRT.

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SECTION FOUR

Financial Balances

Macro Economic Aggregates and Financial Balances of the Plan

Tables :

Macro Economic Balances

Public Sector Outlay and Total Investment

Scheme of Financing the Public Sector Outlays

Estimates of Revenue Receipts

Estimates of Non-Plan Revenue Expenditure

Resources for the Private Sector

Section Four

Macro Economic Aggregates and Financial Balances of the Plan

1. The Draft Fourth Plan postulates an increase in income at 1965-66 prices from Rs. 20000 crores (Rs. 15930 crores in 1960-61 prices) to Rs. 29500 crores in 1970-71 (Rs. 23100 crores in 1960-61 prices). As noted in the section on national income, if all targets of production set for the Fourth Plan are fully realised, the national income in 1970-71 at 1965-66 prices would amount to Rs. 30500 crores (Rs. 23900 crores in 1960-61 prices). The Planning Commission adopted the lower estimate to take care of the possible shortfall due to adverse weather, delay in securing external credit or in implementation, etc. If 1964-65 is taken as the base (1965-66 being an exceptionally bad year), this implies an average annual increase of 5·5 per cent during the Fourth Plan.

2. For achieving the postulated growth in income, the Fourth Plan provides for an aggregate investment of Rs. 21350 crores—Rs. 13600 crores in the public sector and Rs. 7750 crores in the private sector. Table FR.1 gives the estimate of investment in the public and the private sectors by major heads during the Second, Third and Fourth Plans.

3. In addition to the investment outlay of Rs. 21350 crores, the Fourth Plan also provides a current plan outlay of Rs. 2400 crores mainly under agriculture and social services.

4. The sources of finance for the investment are briefly indicated in the following table :

Fourth Plan Investment and its Sources of Finance

(Rs. crores at 1965-66 prices)

source of finance	total investment during the fourth plan				per cent of national income
	public sector	private sector		total	
		household and non-corporate	corporate	total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. investment financed out of	13600	3500	4250	7750	21350	16·1
2. public savings	5250	—	—	—	5250	4·0
3. household savings	3650	3230	1490	4720	8370	6·3
4. corporate savings	—	270	2075	2345	2345	1·7
5. total domestic savings	8900	3500	3565	7065	15965	12·0
6. foreign savings (post devaluation)	4700	—	685	685	5385[1]	4·1
7. national income (cumulative total)					132500	100

Source : (1) Tables FR. 2 and FR. 5. (2) Draft Outline, FFYP.

Note : [1]Includes rupee equivalent of PL 480 imports as reduced by subsidies, freight and US Embassy payments.

5. For the period of the Fourth Plan, the investment would be nearly 16·1 per cent of the national income (assuming national income to grow at a rate of 5·5 per cent per year with 1964-65 as base). It may be noted that the estimate of total domestic saving of Rs. 15965 crores includes Rs. 1700 crores representing the excess of depreciation provision over depreciation outlay during the fourth plan period. Of this Rs. 900 crores is estimated in the private corporate sector (see Table FR. 5) and Rs. 800 crores in the public sector. According to the conventional definition, these amounts do not constitute saving in the economy. If these are excluded, the total domestic saving as a proportion of national income during the Fourth Plan would be reduced from 12·0 per cent to 10·7 per cent. Of this the share of the public sector would be 3·4 per cent, household sector 6·3 per cent and the corporate sector 1·0 per cent.

Macro Economic Balances

6. A set of four national accounts has been worked out for 1965-66 and 1970-71 for checking the internal consistency of the various macro aggregates implicit in the Draft Fourth Plan. These are presented in Tables ME.1, ME.2, ME.3 and ME.4 attached. All figures for 1965-66 given in these tables are at current prices of that year. For 1970-71, while the income and other related magnitudes are at 1965-66 prices, the investment and balance of payment estimates are in post-devaluation rupees.

7. Table ME.1 gives the aggregate availability of resources in the economy during 1965-66 and 1970-71 and the anticipated utilization of these for gross investment—public and private, government consumption and private consumption. The estimate of gross investment and its sources of finance are given in Table ME. 2. The estimates of government consumption as given in Table ME. 1 are derived from Table ME. 3, which gives the Current Account of Government. Ail the three accounts ME. 1, ME. 2 and ME. 3 are fully consistent with each other and are also in line with detailed estimates presented in the earlier part of this section. However, the final account dealing with personal income and its disposition (Table ME. 4) shows a small discrepancy. This mainly arises from the fact that the estimates of private saving as given in Table ME. 2 have been determined independently of other estimates of household income given in Table ME.4.

8. Table ME. 2 highlights the fact that for financing the Fourth Plan, no major change is expected in the share of house-hold and corporate sectors during the Fourth Plan. As a proportion of national income the household and corporate savings are expected to increase only marginally from 6·6 per cent and 1·0 per cent respectively in 1965-66 to 6·7 per cent and 1·1 per cent in 1970-71. A major increase is, however, anticipated under Government saving which is estimated to increase from 1·6 per cent of the national income to 5·3 per cent of the national income. The major source of this increase is the proposed levy of additional taxation and adjustment in the prices of public sector enterprises which are expected to contribute Rs. 920 crores or 3·2 per cent of the national income in 1970-71. The rest of the increase of 0·5 per cent is due to anticipated growth in revenues at a somewhat faster rate than the aggregate revenue expenditure as also the increase in the surpluses of the public sector undertakings at existing basis, largely due to increase in the total stock of capital and fuller operation of some of the enterprises set up in the third plan period.

Macro-economic Balances, India : 1965-66 and 1970-71

Table ME. 1 : Resources and their uses

(Rs. crores)

	1965-66	1970-71		1965-66	1970-71
(1)	(2)	(3)	(4)	(5)	(6)
1. gross domestic product[1]	23500	35660	capital	3500	6470
2. net imports of goods and services[2]	540	450	government consumption	2560	3370
3.			private consumption	17980	26270
4. total	24040	36110	total	24040	36110

Note : [1] See Table ME.4, rows 5 and 1; [2] Excludes factor service payments, Table ME. 4, row 4.

Table ME. 2 : Capital Account

1. net investment	2750	5170	foreign capital	660	800
	(13·8)	(17·5)		(3·3)	(2·7)
2. replacement outlay	750	1300	depreciation provision	1000	1800
	(3·7)	(4·4)		(5·0)	(6·1)
3.			corporate savings	190	320
				(1·0)	(1·1)
4.			private savings	1330	1980
				(6·6)	(6·7)
5.			government savings	320	1570
				(1·6)	(5·3)
6. total	3500	6470	total	3500	6470
	(17·5)	(21·9)		(17·5)	(21·9)
7. national income[1]	20000	29500	national income	20000	29500

Note: Figures within brackets are percentages of national income.

[1]See Table ME. 4 rows 5 and 1.

Table ME. 3 : Government Current Account

1. expenditure	2560	3370	corporate taxes	330	490
2. transfers and subsidies	450	700	other taxes	2615	3970
3. saving	320	1570	other receipts	345	360
4. net interest payment	100	350	additional taxes (Fourth Plan)	—	920
5.			surpluses of enterprizes	140	250
6. total	3430	5990	total	3430	5990

Table ME. 4 : Personal Income

1. gross domestic product	23500	35660			
2. *deduct* depreciation	1000	1800	personal savings	1330	1980
3. *deduct* indirect taxes and miscellaneous receipts	2380	4010	personal taxes	400	720
4. *deduct* income earned from abroad	120	350	consumption	17980	26270
5. national income	20000	29500			
6. *add* national debt interest	200	465			
7. *add* transfers	300	450			
8. *deduct* income accruing to government	210	800			
9. *deduct* corporate savings and corporate taxes	520	810			
10. *add* private donations from abroad	30	30			
11. discrepancy	(—)90	135			
12. personal income	19710	28970	personal income	19710	28970

Note : All figures for 1965-66 are at current prices of that year. For 1970-71 income and other related magnitudes are at 1965-66 prices; and investment and balance of payment estimates are in post-devaluation rupee.

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Table FR. 1 : Public Sector Outlay and Total Investment
India : Second, Third and Fourth Plans

(Rs. crores at current prices)

	second plan[1]					third plan					fourth plan[2]				
	public sector outlay			private sector investment	total investment	public sector outlay[2]			private[1] sector investment	total investment	public sector outlay			private sector investment	total investment
	total	current	investment			total	current	investment			total	current	investment		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1. agriculture and community development	530	320	210	625	835	1105	475	630	800	1430	2410	835	1575	900	2475
2. irrigation	420	—	420	*	420	655	10	645	*	645	965	—	965	—	965
3. power	445	—	445	40	485	1260	10	1250	50	1300	2030	—	2030	50	2080
4. village and small industries	175	85	90	175	265	220	105	115	275	390	370	140	230	320	550
5. industries and minerals	900	30	870	675	1545	1735	35	1700	1050	2750	3935	—	3935	2350	6285
6. transport and communications	1300	25	1275	135	1410	2115	10	2105	250	2355	3010	—	3010	630	3640
7. social services and miscellaneous	830	490	340	950	1290	1540	805	735	1075	1810	3280	1425	1855	1600	3455
8. inventories	—	—	—	500	500	—	—	—	600	600	—	—	—	1900	1900
9. total	4600	950	3650	3100	6750	8630	1450	7180	4100	11280	16000	2400	13600	7750	21350

Source : [1] Government of India, Planning Commission : Third Five Year Plan, pp. 58—59; [2] Government of India, Planning Commission : Fourth Five Year Plan—A Draft Outline, pp. 42—43.

* Included under agriculture and community development.

Table FR. 2 : Scheme of Financing the Public Sector Outlays
India : 1951-52 to 1970-71

(Rs. crores at current prices)

	first plan						second plan					
	1951-56	1951-52	1952-53	1953-54	1954-55	1955-56	1956-61	1956-57	1957-58	1958-59	1959-60	1960-61
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. balance from current revenues	324	150	63	44	62	65	11	91	8	(—)34	(—)17	(—)37
2. surpluses of public enterprizes	115	38	23	13	19	22	167	33	29	22	36	47
3. railways	115	38	23	13	19	22	167	33	29	22	36	47
4. undertakings other than railways	—	—	—	—	—	—	[1]	[1]	[1]	[1]	[1]	[1]
5. capital receipts	684	(—)29	55	188	224	246	1439	164	88	441	411	335
6. market loans (net)	204	(—)23	16	2	120	89	756	144	70	230	179	133
7. small savings (net)	243	39	40	40	56	68	422	62	71	79	86	124
8. annuity deposits (net)	—	—	—	—	—	—	—	—	—	—	—	—
9. provident funds (net)	92	13	12	20	23	24	175	27	28	25	35	60
10. miscellaneous capital receipts (net)	145	(—)58	(—)13	126	25	65	86	(—)69	(—)81	107	111	18
11. budgetary receipts corresponding to external assistance	189	65	46	19	16	43	1049	40	90	231	198	490
12. deficit financing	333	2	45	36	93	157	954	253	497	140	112	(—)48
13. additional taxation	255	33	36	43	62	81	1052	54	178	218	272	330
14. total resources	1960	259	268	343	476	614	4672	635	890	1018	1012	1117
15. public sector plan outlay	1960						4600					
16. current outlay	400						950					
17. investment	1560						3650					
18. private sector investment	1800						3100					
19. total investment	3360						6750					

Note: [1] Included in items 1 and 10.

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Table FR. 2 : Scheme of Financing the Public Sector Outlays
India : 1951-52 to 1970-71—*contd.*

(Rs. crores at current prices)

	third plan						fourth plan					
	1961-66	1961-62	1962-63	1963-64	1964-65	1965-66	1966-71	1966-67	1967-68	1968-69	1969-70	1970-71
(1)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1. balance from current revenues[1]	(—)473	163	56	(—)156	(—)163	(—)373	3345	341	493	698	828	985
2. surpluses of public enterprizes	696	75	78	176	130	237	1345	252	242	261	282	308
3. railways	80	43	28	29	(—)8	(—)12	260	34	42	51	61	72
4. undertakings other than railways	616	32	50	147	138	249	1085	218	200	210	221	236
5. capital receipts	2139	340	386	382	547	484	3880	577	654	751	875	1023
6. market loans (net)	914	133	192	184	243	162	1500	209	244	285	345	417
7. small savings (net)	583	92	79	137	129	146	1000	135	56	188	235	286
8. annuity deposits (net)	115	—	—	30	42	43	150	35	33	31	28	23
9. provident funds (net)	340	54	59	71	72	84	565	88	98	111	125	143
10. miscellaneous capital receipts (net)	187	61	56	(—)40	61	49	665	110	123	136	142	154
11. budgetary receipts corresponding to external assistance	2455	262	406	497	572	718	4700	900	1000	1050	950	800
12. deficit financing	1151	184	183	211	188	385	—	—	—	—	—	—
13. additional taxation	2660	104	276	600	757	923	2730	155	365	555	730	925
14. total resources	8628	1128	1386	1709	2031	2374	16000	2225	2754	3315	3665	4041
15. public sector plan outlay	8630						16000					
16. current outlay	1450						2400					
17. investment	7180						13600					
18. private sector investment	4100						7750					
19. total investment	11280						21350					

Note : [1] For details see Tables FR. 3 and FR. 4.

Table FR. 3 : Yearwise Estimates of Revenue Receipts of the Centre and the States
India : Third and Fourth Plans

(Rs. crores at current prices)

heads of revenue	third plan						fourth plan					
	1961-62	1962-63	1963-64	1964-65	1965-66	total	1966-67	1967-68	1968-69	1969-70	1970-71	total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. *tax revenue*	*1537*	*1857*	*2316*	*2588*	*2844*	*11142*	*3203*	*3486*	*3799*	*4043*	*4328*	*18859*
2. direct taxes	439	550	681	730	730	3130	755	779	838	903	973	4248
3. income tax	165	186	259	267	260	1137	260	254	274	296	320	1404
4. corporation tax	157	221	275	314	330	1297	340	367	404	444	488	2043
5. estate duty	4	4	5	5	7	25	7	7	8	8	8	38
6. tax on wealth	8	9	10	11	14	52	14	15	15	16	17	77
7. expenditure tax	1	—	—	—	1	2	—	1	1	1	1	4
8. gift tax	1	1	1	2	3	8	3	3	3	4	4	17
9. land revenue	103	129	131	131	115	609	131	132	133	134	135	665
10. indirect taxes	1098	1307	1635	1858	2114	8012	2448	2707	2961	3140	3355	14611
11. customs	212	246	335	398	531	1722	690	756	832	805	771	3854
12. union excise duty	489	599	730	802	861	3481	940	1056	1150	1263	1412	5821
13. state excises	58	63	73	85	91	370	99	104	110	116	122	551
14. sales taxes	188	215	277	336	374	1390	429	473	520	592	629	2623
15. stamps and registration	50	58	66	75	79	328	81	87	92	97	103	460
16. tax on motor vehicles and passengers and goods	45	56	76	82	90	349	102	114	128	144	161	649
17. electricity duties	15	19	27	33	35	129	45	50	56	63	71	285
18. others	41	51	51	47	53	243	62	67	73	80	86	368
19. *non-tax revenue*	*433*	*518*	*604*	*608*	*696*	*2859*	*765*	*824*	*903*	*989*	*1074*	*4555*
interest receipt												
20. railways and posts and telegraphs	59	66	77	89	98	389	112	121	130	139	146	648
21. others	80	101	153	173	228	735	264	286	325	367	416	1658
22. currency and mint	54	54	56	54	63	281	65	66	67	68	69	335
contribution from public undertakings												
23. railways	21	20	25	23	26	115	33	36	39	43	48	199
24. posts and telegraphs	1	1	1	1	—	4	4	4	4	4	5	21
25. other central undertakings	11	3	4	7	10	25	7	8	10	12	13	50
26. state undertakings	(—)3	20	6	(—)30	(—)44	(—)51	(—)31	(—)22	(—)11	2	7	(—)55
27. others including administrative receipts	220	253	282	291	315	1361	311	325	339	354	370	1699
28. total revenue receipts	1970	2375	2920	3196	3540	14001	3968	4310	4702	5032	5402	23414

Table FR. 4 : Yearwise Estimates of Non-Plan Revenue Expenditure of the Centre and the States
India : Third and Fourth Plans

(Rs. crores at current prices)

heads of expenditure	third plan						fourth plan					
	1961-62	1962-63	1963-64	1964-65	1965-66	total	1966-67	1967-68	1968-69	1969-70	1970-71	total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. *non-developmental* . .	*1120*	*1436*	*1822*	*1926*	*2211*	*8515*	*2533*	*2661*	*2842*	*3021*	*3211*	*14268*
2. defence including capital outlay . . .	312	474	816	806	888	3296	918	962	1000	1040	1080	5000
3. capital outlay on border roads . . .	23	29	37	37	38	164	34	34	34	34	34	170
4. interest on debt . .	221	286	301	353	427	1588	517	623	715	813	911	3579
5. appropriations for reduction or avoidance of debt	32	42	54	56	67	251	103	85	92	100	108	488
6. expenditure on administration and tax collection	340	363	381	418	475	1977	515	532	551	567	586	2751
7. currency and mint . .	12	22	16	15	17	82	18	20	22	24	26	110
8. export subsidies . .	6	14	4	4	27	55	19	25	30	35	41	150
miscellaneous . .												
9. expenditure on displaced persons . .	7	6	6	10	9	38	10	10	10	10	10	50
10. aid to Nepal and S.E. Asia . . .	3	2	3	8	12	28	8	10	10	11	11	50
11. write back of trading losses on foodgrains .	10	13	13	15	18	69	63	32	31	24	23	173
12. repayment of capital expenditure on grants to states . . .	5	6	8	10	12	41	19	22	25	28	31	125
13. increase in current cost due to devaluation .	—	—	—	—	—	—	70	80	90	100	115	455
14. others . . .	149	179	183	194	221	926	239	226	232	235	235	1167
15. *developmental* . . .	*592*	*620*	*660*	*677*	*778*	*3327*	*1095*	*1157*	*1161*	*1183*	*1205*	*5802*
16. non-plan development expenditure . .	592	620	653	664	763	3292	1025	1060	1098	1132	1167	5482
17. non-plan grants to union territories . . .	—	—	7	13	15	35	20	22	24	26	28	120
18. additional subsidy on sale of fertilizer due to devaluation	—	—	—	—	—	—	50	75	40	25	10	200
19. total revenue expenditure .	1712	2056	2482	2603	2989	11842	3628	3818	4004	4204	4416	20070

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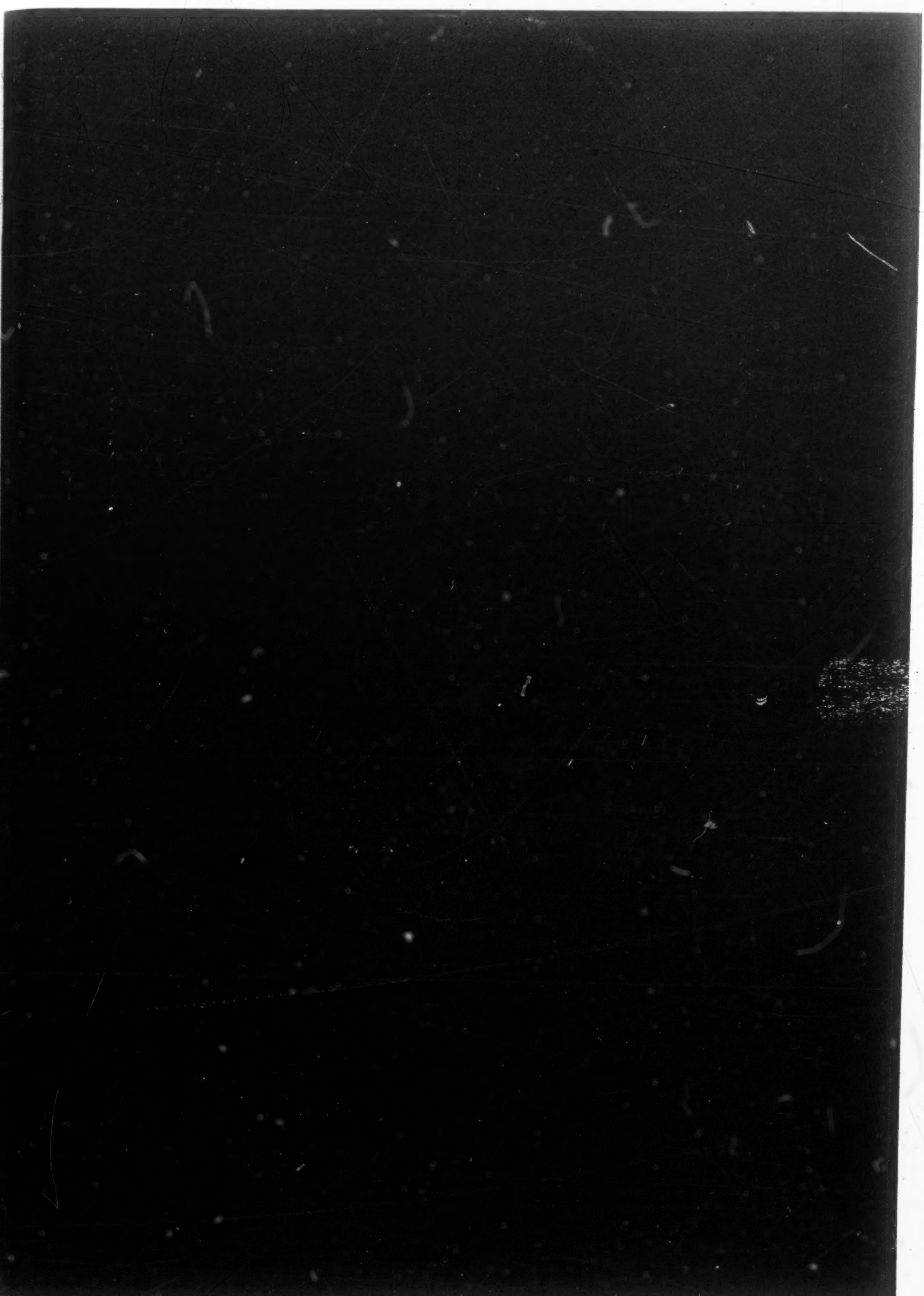
Table FR. 5 : Estimated Availability of Resources for the Private Sector during the Fourth Plan Period

(Rs. crores at 1965-66 prices)

(1)	amount (2)
1. private savings	9670
2. non-financial corporate sector	1165
3. financial corporate sector	55
4. cooperatives	80
5. households	8370
6. government draft on private savings	3650
7. private savings available for private investment (1 minus 6)	6020
8. retained surplus of the Reserve Bank available for private investment	125
9. net inflow of funds from abroad	685[1]
10. surplus available from depreciation provision in the private corporate sector (depreciation provision less replacement outlay and addition to cash and deposits)	910
11. total resources available for the private sector (exclusive of capital transfers to the private sector included under public sector outlay)	7740

Source : Planning Commission, *Report of the Working Group on Private Investment*, August, 1966.

Note : [1]In terms of post-devaluation rupee.



SECTION FIVE

Balance of Payments and Aid Requirements during the Fourth Plan

India's Balance of Payments and Aid Requirements for the Fourth Plan

Tables:

A Tentative Estimate of the Balance of Payments

Estimates of Maintenance Imports

Estimates of Project Imports

Estimates of Exports

Section Five

India's Balance of payments and aid requirements during the Fourth Plan

1. This note attempts an estimate of India's balance of payments position during the Fourth Plan and the gap which will require to be met through external aid. The estimates have been made on the basis of a detailed examination of :

(*a*) Maintenance imports

(*b*) Project imports

(*c*) Exports

(*d*) Invisibles on current account

(*e*) Debt servicing liability for external debt.

2. The position is summarized in Table BP.1. The estimates do not take into account the imports of foodgrains and cotton to be financed out of PL 480 assistance. The figures given in this as well as in subsequent tables are in terms of pre-devaluation rupees (These are easily converted in terms of post-devaluation rupees by multiplying each figure by 1·575. The figures on the latter basis in Rs. crores are shown within brackets in the discussion which follows.)

3. The commodity imports for 'maintenance requirements' as well as on account of 'project imports' are estimated to amount to Rs. 7650 crores (12050) during the fourth plan period. Taking into account the debt servicing charges estimated to be of the order of Rs. 1450 crores (2285) total payments on external account will aggregate to Rs. 9100 crores (14335).

4. On the credit side, export earnings during the plan period are anticipated to amount to Rs. 5100 crores (8035), leaving a gap of Rs. 4000 crores (6300) needed to be filled by external loans on non-commercial and commercial terms, external grants and direct foreign private investment. On the assumption that direct private foreign investment may amount to Rs. 300 crores (475) during the fourth plan period, the balance of Rs. 3700 crores (5825) represents the gross aid requirements for the implementation of the Fourth Plan.

5. The yearwise estimates of (*a*) maintenance imports, (*b*) project imports, (*c*) exports, (*d*) invisibles, and (*e*) debt servicing liability on account of external debts, are discussed separately in the following paragraphs.

Maintenance Imports

6. Table BP. 2 gives in a summary form the position about maintenance imports during the fouth plan period. The maintenance imports are defined to include all imports other than PL 480 imports and imports of machinery which are directly used in investment and do not require further processing within the country. The requirements of these imports are placed at Rs. 5200 crores (8190). This represents the estimate as approved by the Planning Commission on a review of the Report of the Working Group on Maintenance Imports submitted in July 1966, which had arrived at an estimate of total maintenance imports of Rs. 5485 crores (8640)[1].

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[1]Planning Commission, *Report of the Working Group on Maintenance Imports*, July 1966. Also see :

(*i*) Planning Commission, PP Division, *Maintenance Imports and Aid Requirements for the Fourth Plan*, March 1966.

(*ii*) Ministry of Finance, Department of Economic Affairs, *Revised Draft Report on Maintenance Imports during the Fourth Plan*, July 1965.

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7. The imports of different commodities have been worked out as a difference between demand of these commodities and the estimate of domestic production during that period. The demand for each imported commodity has been estimated on the basis of input requirements per unit of production in the using sector and the expected level of output of the sector. The yearwise phasing of this demand presents difficulties because of lack of precise information about output in each year of the Plan, even if it is assumed that the terminal year target is given. Every effort has been made to assess the likely output year-wise in respect of important sectors such as steel, aluminium, fertilizers, petroleum products etc. by reference to individual enterprizes and projects and their expected performance. But where there is no clear indication, the output (and consequential demand estimates) have been worked by interpolation.

8. Indigenous production estimates are generally the same as given in the Fourth Plan Outline. Year-wise phasing has been done on the basis of the assessment made by the concerned Ministries and Divisions of the Planning Commission.

9. These estimates are also predicated on the assumption that the imports of consumer goods and raw materials required for them will continue to be restricted. The validity of the estimates of maintenance imports is dependent on the extent of fulfilment of the Fourth Plan targets and expectations of output not only for 1970-71 but for the intervening years. Any slide back in domestic production is likely to give rise to larger maintenance imports, making an already tight balance of payments position still more difficult.

Project Imports

10. The requirements of project imports during the Fourth Plan are estimated at Rs. 2450-2500 crores (3860) (See Table BP.3). These are based on information and data provided by the Ministries and departments concerned and are believed to have been arrived at after making due allowance for maximum contribution by domestic producers. To some extent a reduction in project imports may be accompanied by larger imports of components, parts and materials under 'maintenance imports' to enable domestic machinery manufacturers to increase their output. Thus the reduction on one account will be partly offset by the increase on the other. Of the total, about Rs. 850 crores (1340) would be available out of aid authorized during the Third Plan. The balance of Rs. 1600 crores (2520) would have to be met out of foreign aid to be negotiated during the Fourth Plan. As there is inevitably a time lag between the authorization and utilization of aid, it is necessary that the balance of Rs. 1600 crores (2520) is tied in the first two or three years of the Fourth Plan if all the projects included in the Fourth Plan are to be fully implemented.

11. Detailed phasing of the project imports by relating them to the schedule of construction of different projects is yet to be made in respect of many sectors. The phasing as given in Table BP.I is tentative and is based on the assumption that with growing indigenous availability of machinery the project imports will start declining from the third year of the Fourth Plan.

Exports

12. The actual level of exports by major commodities during 1961-62, 1964-65 and 1965-66 and targets for 1966-67, 1970-71 and 1975-76 are given in Table BP.4. Export earn

ings are expected to increase from Rs. 816 crores (1285) in 1964-65 to Rs. 830 crores (1305) in 1966-67 and Rs. 1225 crores (1930) in 1970-71. The aggregate earnings are estimated at Rs. 5100 crores (8035) during the fourth plan period. This implies growth of exports at the rate of 9 to 10 per cent per annum, which appears necessary for limiting aid to Rs. 3700 crores (5825) and for achieving self reliance by the beginning of the Sixth Five Year Plan.

13. The figure of Rs. 5100 crores (8035) is the same as arrived in September 1965 on the basis of a number of studies made in the Planning Commission and the Ministry of Commerce. Exports were then expected to increase from the level of Rs. 850 crores (1340) in 1965-66 to Rs. 1110 crores (1750) in 1970-71. But as actual exports in 1965-66 turned out to be only Rs. 810 crores (1275), it is evident that more intensive effort will be required to achieve the target of Rs. 5100 crores (8035). The opportunity offered by the recent devaluation of the rupee should be fully seized to put export promotion on a stable and permanent basis.

14. As will be seen from Table BP. 4, major increases are envisaged under tea, iron ore, engineering goods, jute manufactures, fruits and vegetables, vegetable oils (non-essential), oil cakes, fish, iron and steel and chemicals and allied products. The targets of exports under different heads are, however, tentative and are likely to undergo change in the light of actual experience and studies made in the Planning Commission, the Ministry of Commerce and other appropriate agencies.

Invisibles on Current Account

15. Satisfactory estimates have not so far been made of net receipt from invisibles during the fourth plan period. In a paper prepared by the Reserve Bank of India for the Resources Working Group (April 1964), it was estimated that exclusive of interest payments on Government account estimated at Rs. 750 crores (1180) during the fourth plan period as well as receipts on account of U.S. Embassy expenditure, the invisible account will show a net balance of Rs. 160 crores (250). The Working Group on Resources after a further consideration decided to reduce this balance to a nil figure.

Servicing of External Debt

16. The estimates of interest payments on external loans and the annual repayment liability has been worked by taking the gross external aid at Rs. 3700 crores (5825) during the fourth plan period and Rs. 1800 crores (2835) during the fifth plan period. It has been further assumed that the existing terms of repayment of different types of loans and commercial credits as well as the interest charged on them will continue as at present.

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Table BP.1 ; A Tentative Estimate of Balance of Payments
India : 1961-62 to 1975-76

(Rupees crores at pre devaluation exch ange rate)

	1961-62	1964-65	fourth plan						1975-76[1]
			1966-67	1967-68	1968-69	1969-70	1970-71	total fourth plan	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. *total payments*	*1001*	*1255*	*1555*	*1820*	*1900*	*1930*	*1895*	*9100*	*2165*
2. commodity imports[1]	910	1134	1375	1585	1615	1580	1495	7650	1640
3. maintenance imports[2]	660	814	975	1035	1065	1080	1045	5200	1340
4. project imports[3]	250	320	400	550	550	500	450	2450	300
5. servicing of external debt[4]	91	121	180	235	285	350	400	1450	525
6. interest payments	33	52	80	100	120	150	170	620	200
7. capital payments	58	69	100	135	165	200	230	830	325
8. *total receipts*	*683*	*797*	*830*	*920*	*1010*	*1115*	*1225*	*5100*	*1925*
9. commodity exports[1]	668	803	830	920	1010	1115	1225	5100	1875
10. invisibles (net)	15	(—)6	—	—	—	—	—	—	50
11. *balance of payments met out of*	*318*	*458*	*725*	*900*	*890*	*815*	*670*	*4000*	*240*
12. net inflow of private capital	318	458	50	55	60	65	70	300	70
13. external assistance[5] (gross)			675	845	830	750	600	3700	170

Source : **1.** Maintenance imports—Tables BP. 2 and BP. 2-1; **2.** Project imports—Table BP. 3.; **3.** Exports—Table BP. 4; and **4.** 1961-62 and 1964-65—**Government of India, Ministry of Finance,** Economic Survey, 1965-66.

Note : [1]Figures of commodity imports and exports for 1961-62 and 1964-65 as given in this table are based on balance of payment data of Reserve Bank and do not agree with the figures given in Tables BP. 2 and BP. 4, which are based on customs data ; [2]Figures of maintenance imports exclude imports financed out of PL 480 assistance. These amounted to Rs. 86 crores in1961-62 and Rs. 229 crores in 1964-65; [3]Figures of project imports for 1961-62 and 1964-65 are roughly estimated; [4]Figures of debt servicing liability have been worked out on the assumption that terms of repayment and interest would remain the same as at present; [5]The phasing of aid requirements shown in this table is somewhat different from that given in the Calculations of Financial Resources for the Plan (Section 4, Table FR.2). This is because the phasing of aid in the two estimates have been derived from different approaches. While there is some discrepancy in annual phasing for the Plan as a whole the estimates are identical.

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Table BP.2 : Estimates of Maintenance Imports
India : 1961-62 to 1975-76

(Rupees crores at pre-devaluation exchange rate)

	1961-62	1964-65	fourth plan						1975-76
			1966-67	1967-68	1968-69	1969-70	1970-71	total fourth plan	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. iron and steel	101	107	125	130	117	146	137	655	80
2. non-ferrous metals	51	59	96	113	129	137	155	630	230
3. crude oil and petroleum products	96	68	95	99	95	93	90	472	150
4. fertilizers and fertilizer raw materials	14	29	114	138	160	137	92	641	140
5. chemicals, drugs, dyes (including sulphur, rubber and chemical pulp)	94	85	77	77	69	64	61	348	100
6. textile fibres and yarn	73	69	61	62	62	55	50	290	70
7. vegetable oils	14	12	13	14	15	16	17	75	25
8. paper, paperboard and newsprint	16	13	16	16	14	11	9	66	20
9. components and spares for machinery and transport equipment	100	153	164	189	211	228	238	1030	300
10. miscellaneous including normal marketing of food	144	219	214	197	193	193	196	993	225
11. total	703	814	975	1035	1065	1080	1045	5200	1340
12. working group estimates			995	1070	1127	1151	1142	5485	

Source : 1 For 1961-62 and 1964-65—Government of India, Monthly Statistics of the Foreign Trade of India, Volume II, March 1962 and March 1965. For 1964-65 the data adjusted to make it equal to balance of payments estimates made by Reserve Bank. 2. Fourth Plan—Planning Commission, Report of the Working Group on Maintenance Imports as revised by the Planning Commission; and 3. 1975-76—PPD estimates.

Note : For details see Table BP. 2.1

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Table BP.2·17: Requirements of Maintenance Import

	item	unit	1961-62 quantity	1961-62 value	1964-65 quantity	1964-65 value	1966-67 quantity	1966-67 value	1967-68 quantity	1967-68 value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	mild steel	mil. tonnes	1	87·9	1·1	92	1	80	1·1	88
2.	special steel	thou. tonnes	45·5	12·9	54	14·7	150	45	140	42
3.	non-ferrous metals			51		58·8		5·7		112·7
4.	aluminium	thou. tonnes	25·6	7·9	22·9	7·2	2	0·6	19	5·7
5.	raw materials for aluminium			1·1		0·7		3·8		3·8
6.	copper	thou. tonnes	71·2	23·3	58·4	24·4	90·5	52·5	100·5	58·3
7.	lead	thou. tonnes	29	2·6	34	4·6	57	9·5	67	11·1
8.	zinc metal	thou. tonnes	67	7·4	71	11·3	76	12·2	69	11·1
9.	zinc concentrates	thou. tonnes		—		—	17·6	1	33	1·8
10.	tin	thou. tonnes	4·9	5·8	5	7·9	6·5	11·6	7·2	12·9
11.	other non-ferrous metals			2·9		2·7		4·5		8
12.	platinum	kgs.	112	0·1	91	0·1	260	0·3	300	0·4
13.	antimony ore	thou. tonnes	1·3	0·2	1·7	0·4	2·6	0·8	2·6	0·8
14.	magnesium			neg.		neg.		0·1		0·1
15.	nickel	thou. tonnes	1·8	1·5	1·7	1·5	2·5	2·3	4	3·7
16.	ferro-alloys etc.			1·1		0·7		1		3
17.	petroleum (crude)	mil. tonnes		42·4		27·2	8·2	51·7	10·3	65·1
18.	petroleum products	mil. tonnes		53·3		41·3	1·9	43·2	1·1	33·8
19.	fertilisers			14·2		29·1		114		138·5
20.	nitrogenous (N)	thou. tonnes	88	10·5	182	20·5	600	78	700	91
21.	phosphatic (P_2O_5)	thou. tonnes	neg.	neg.	7·9	2·8	170	15	100	9
22.	potassic (K_2O)	thou. tonnes	32	1·4	52	2·1	200	9	300	13·5
23.	rock phosphate	thou. tonnes	254	2·3	426	3·7	640	7	1280	14
24.	sulphur for fertilisers	thou. tonnes	[1]	[1]	[1]	[1]	180·5	5	360	11
25.	chemicals			93·9		84·7		77·4		76·6
26.	sulphur	thou. tonnes	212	3·5	278	5·4	283	8·5	302	9
27.	caustic soda	thou. tonnes	26·8	1·7	67·7	3·3	34	1·8	34	1·8
28.	soda ash	thou. tonnes	34	0·7	33·5	0·6	34	0·8	35	0·8
29.	mercury	tonnes	124	0·3	185	0·6	126	0·9	148	1
30.	asbestos	thou. tonnes	21·7	2·5	39·6	4·1	60	6·3	66	6·9
31.	rubber	thou. tonnes	38·4	10·1	21	5·4	2	0·5	14	3·6
32.	carbon black	thou. tonnes	17·1	2	10·7	1·3	5·2	0·6	3·9	0·5
33.	chemical pulp (rayon grade)	thou. tonnes	64	5·6	80	7·3	84	8	84	8
34.	organic chemicals			22		20·8		35		30
35.	miscellaneous chemicals			45·5		35·9		15		15
36.	textile fibre and yarn			72·8		69		61·1		62·1
37.	raw cotton	thou. bales		40·6		36·1	420	31·5	420	31·5
38.	rayon and staple fibres			12·8		12·7		—		—
39.	synthetic fibres	thou. tonnes		0·3		2·7	7	7	8·8	8·8
40.	wool			12·2		9·6		13·6		12·8
41.	jute			6·3		7·4		7		7
42.	others			0·6		0·5		2		2
43.	paper, paper board, news-print etc.			15·9		13·1		15·4		15·7
44.	paper and paper board	thou. tonnes	27	5·6	24	5·4	24	6	24	6
45.	news-print	thou. tonnes	124	9·7	102	7·4	114	8·2	117	8·5
46.	chemical pulp (paper grade)	thou. tonnes	7	0·6	3	0·3	10	1·2	10	1·2
47.	vegetable oils and oil seeds			14·7		11·8		13		14
48.	components and spares[2]			100		153		164		189
49.	miscellaneous			144		219·3		214		197
50.	total maintenance imports[3]			703		814		974·5		1034·5

Source: As given in Table BP. 2.

Note: [1] Import of sulphur for fertilisers during 1961-62 and 1964-65 is included under chemicals; [2] Figures of components and imports financed out of PL 480 assistance, which amounted to Rs. 86 crores in 1961-62 and Rs. 229 crores in 1964-65.

India : 1961-62, 1964-65, 1966-67 to 1970-71 and 1975-76

(Rs. crores at pre-devaluation exchange rate)

1968-69		1969-70		1970-71		1975-76	
quantity	value	quantity	value	quantity	value	quantity	value
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1·1	88	1·6	128	1·7	137	1	80
97	29	60	18	—	—	—	—
	128·5		137·2		154·9		232
32	9·6	—	—	—	—	—	—
	3·4		4·5		5		5
109	63·2	119	69	127·5	74	150	87
79	13·1	92	15·3	110	18·3	100	17
67	10·7	61	9·8	49	7·8	100	16
44	2·4	70·4	3·9	110	6		11
8	14·3	8·9	15·9	9·9	17·8	14	25
	11·8		18·8		26		71
360	0·4	420	0·5	500	0·6		—
2·7	0·8	2·8	0·8	3	0·9		—
	0·2		0·4		0·7		—
7	6·4	11	10·1	15	13·8		—
	4		7		10		—
11·8	74·3	12·8	80·6	12·8	80·6		150
0·6	21	0·4	12·5	0·6	9·4		—
	160·3		136·8		91·5		140
740	96	500	65	—	—	—	—
150	13	—	—	—	—	—	—
450	20·3	550	24·8	700	31·5	1000	45
1600	18	2560	28	3200	36	5400	59
450	13	640	19	800	24	1000	36
	68·5		64·4		61·3		100
170	5·1	53	1·6	123	3·7	250	9
—	—	—	—	—	—	—	—
28	0·6	—	—	—	—	—	—
326	2·3	164	1·4	320	2·2	350	2·5
73	7·6	82	8·5	93	9·7	110	12
16	4·1	19	4·8	10	2·7	100	27
6·7	0·8	1·2	0·1	—	—	6	0·5
84	8	84	8	84	8	—	—
	25		25		20		25
	15		15		15		24
	61·5		54·9		50·3		70
420	31·5	350	26·2	350	26·2	540	40
	—		—		—		—
9·5	9·5	8	8	1·5	1·5		
	12·5		13·7		15·6		20
	6		5		5		7
	2		2		2		3
	14·2		11·4		8·8		20
20	5	16	4	16	4	40	10
111	8	85	6·2	50	3·6	150	10
10	1·2	10	1·2	10	1·2		—
	15		16		17		25
	211		228		238		300
	193		193		196		225
	1064·3		1080·8		1044·8		1342

spares for 1961-62 and 1964-65 are roughly estimated. The balance has been shown as project imports ; and [2] Figures exclude

Table BP. 3 : Estimates of Project Imports
India : Fourth Plan

(Rs. crores at pre-devaluation exchange rate)

head of development	total fourth plan
(1)	(2)
1. agricultural programmes	164
2. agricultural production	133
3. minor irrigation	14[1]
4. forests	2[1]
5. fisheries	15
6. irrigation and power	422
7. irrigation and flood control	95
8. power	327
9. public sector	322
10. private sector	5
11. industries and mining	1347
12. village and small industries	31
13. organised industry and mineral development	1366
14. public sector	801
15. private sector	565
16. transport and communications	385
17. railways	56
18. roads	7
19. ports	50
20. shipping	107
21. civil air transport	33
22. other transport	13[2]
23. communications and postal services	57
24. broadcasting	12
25. social services and miscellaneous	132
26. education	38
27. scientific and technological research	37
28. health and water supply and sanitation	41
29. labour and labour welfare	6
30. rehabilitation	5
31. miscellaneous	5[3]
32. total	2500

Source : Planning Commission Estimates made by the Divisions, Sept. 1966.

Note : [1] Excluding requirements of tractors which are included under agricultural production; [2] Including Rs. 7 crores for Farakka Barrage; and [3] Including housing and statistical schemes,

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Table BP. 4 : Estimates of Export, India : 1961-62, 1964-65, 1966-67, 1970-71 and 1975-76

(Rs. crores at pre-devaluation exchange rate)

commodity	unit	1961-62		1964-65		1966-67 (estimated)		1970-71 (estimated)		1975-76 (estimated)	
		quantity	value	quantity	value	quantity	value	quantity	value	quantity	value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. agriculture and allied crops (including plantation crops)			261·1		317·3		301·6		454		665
2. vegetable oils (non-essential)	thou. tonnes	38·9	5·8	44·4	7	27·6	4·6	100	24	167	40
3. oil cakes	thou. tonnes	506	17·3	975	39·8	900	34·2	1365	54	2149	85
4. tobacco unmanufactured	million kgs.	44·4	14	78·6	24·4	70	23·1	100	33	136	45
5. spices	million kgs.	64·2	17·5	53·3	16·7		23·1		29		35
6. sugar	thou. tonnes	372	14·6	271	21·2	430	13·7	600	19	1105	35
7. fruits and vegetables			25·5		36·8		36		58		80
8. fish	million kgs.	15·7	3·9	19·6	6·8	20	8	60	24	105	42
9. raw cotton	thou. tonnes	62	14·3	47	10·6	39	10·5	52	14	71	19
10. raw wool	million kgs.	14·5	8·4	12	7·7	11·1	6	11·4	6	17	9
11. tea	million kgs.	207	122·6	212	124·6	215	117·4	300	164	430	235
12. coffee	million kgs.	29·7	9	31	13·4	35	16·6	40	19	57	27
13. hides and skins (raw)	million kgs.	11·7	8·2	12·4	8·3	11	8·4	13·5	10	17·5	13
14. minerals			55·8		60		69·5		106		157
15. iron ore	million tonnes	9·8	35·4	10·5	37·2	13·5	47·2	22	77	34	120
16. manganese ore	thou. tonnes	995	10·7	1552	13·1	1300	10·6	1800	15	2400	20
17. mica	million kgs.	28	9·7	31	9·7	45	11·7	55	14	67	17
18. manufactures			280·5		334·2		349·6		500		805
19. cotton fabrics	million metres	513	48·2	523	57·6	490	53·3	665	67	893	90
20. jute goods	thou. tonnes	803	145·9	960	168·3	950	174·4	1150	211	1417	260
21. art silk fabrics	million metres	81·3	7·6	57·4	6·5	50	5·1	100	10	230	23
22. clothings			0·7		4·6		7·6		19		40
23. coir yarn and manufactures	thou. tonnes	74·6	11·2	74·7	11·3	75	11·2	106	16	166	25
24. footwear	million pairs	4·6	2·4	7·6	4·2	13	7·2	25	14	50	28
25. leather and leather manufactures			25·4		27·4		29		38		45
26. engineering goods			6·9		14·3		15·9		48		134
27. handicrafts			19·3		25·3		26·6		32		55
28. iron and steel	thou. tonnes		4		4·4	160	6·4	500	20	1100	45
29. chemicals and allied products			3·7		6·8		9·5		19		50
30. cotton waste	thou. tonnes	41·6	5·2	34·3	3·5	35	3·4	60	6	100	10
31. other exports			82·3		104·8		109·3		164		248
32. total exports			679·7		816·3		830		1224		1875

Source : 1. 1966-67 and 1970-71—Planning Commission estimates; and 2. 1975-76—PPD estimates.
PPD/Sept. 1966

SECTION SIX

Structure of the Indian Economy in 1964-65, 1970-71 and 1975-76

Object, Method and Results

Input-Output Tables: 1964-65, 1970-71 and 1975-76

Appendix I:

Estimates of Gross Domestic Expenditure and its Disposition

Appendix II:

Projections of Pattern of Final Demand

Section Six

Structure of the Indian Economy in 1964-65, 1970-71 and 1975-76

1. This paper summarises the results of a study based on an inter-industry consistency model[1] to project the mutually consistent levels of output to be achieved in different sectors by 1970-71 and 1975-76 in order to realise specified targets of income, investment and consumption under given constraints regarding imports and balance of payments.

2. The projections for 1970-71 are based on the macro economic dimensions postulated in the Draft Outline of the Fourth Plan. As regards 1975-76, alternative I postulates that the economy will grow at a sustained rate of about 7 per cent a year during the Fifth Plan and beyond. Alternative II explores the implications of seeking to realise the aggregate income target for 1975-76 (Rs. 340 billion at 1960-61 prices) as set out in the Third Five Year Plan. It postulates a higher target for the rate of savings and of investment in 1975-76. At the same time unlike alternative I which provides for complete elimination of aid, alternative II takes credit for normal inflow of capital and commercial credits.

3. Starting from the overall targets of income, savings and investment, the study works out in successive stages—

(*a*) the aggregate expenditure and its disposition ;

(*b*) the commodity composition of final demand;

(*c*) the levels of domestic output to be achieved in different sectors; and

(*d*) the sectoral distribution of national income.

4. The estimate of gross domestic expenditure and its disposition for different years and their bases for these computations are explained in Appendix 1.

5. Appendix 2 describes the assumptions and procedures used for estimating the commodity composition of the major categories of final demand namely, private consumption, public consumption, capital formation and exports.

6. The vector of final demand so derived is applied to a matrix of input-output coefficients to solve for output levels. The matrix which relates to 1964-65, has been built by the Planning Unit of the Indian Statistical Institute. The matrix which consists of 77 sectors is based on detailed analysis of outputs and inputs of different sectors of the economy in 1964-65. All outputs and inputs have been valued at factor cost of 1960-61. For purposes of projection, some of the coefficients have been changed for future years to take into account significant changes anticipated in product mix or technology on the basis of relevant technical information.

7. The Model is static in the sense that it seeks to estimate a mutually consistent set of output levels corresponding to exogenously specified levels of consumption, investment, exports and imports. The model itself does not provide a check on the consistency between the postulated levels of investment during different time periods and the investment required to reach the production levels. However, this consistency has been broadly verified by independent studies in the Perspective Planning Division.

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[1]For a more detailed discussion of the type of problems involved in compiling and adapting available data for use in such work see Manne A.S. and Rudra A. *A Consistency Model of India's Fourth Plan, Sankhya,* 1965.

A fuller Report is under preparation.

8. Although the Model is not dynamic in the above sense, the comparison of the structure of production at different points of time provides useful insights into the rate and directions of growth which needs to be planned for over the Fourth and Fifth Plans in order to reach specified overall objectives.

9. Appendix 3 gives the complete transactions matrix for 1964-65, 1970-71 and 1975-76 obtained from the Model[1]. Each cell contains four figures. The figures at the left top corner relate to 1964-65; those at the left bottom corner relate to 1970-71; the figures on the right top corner correspond to alternative I for 1975-76 and those on the right bottom corner to alternative II. Reading across rows, the table gives details of the disposition of gross output of the particular sector. Reading down the columns one gets the value of inputs absorbed by the particular sector, as well as the value added by it.

10. For convenience of reference, Table IR. 1 gives the physical output levels of selected major sectors in 1964-65, 1970-71 and 1975-76 as obtained from the Model. For 1970-71 the corresponding output targets as indicated in the Draft Outline of the Fourth Plan are also given. In most of the cases, the output levels indicated by the Model are in close agreement with Plan targets.

11. Table IR. 2 presents the sectoral distribution of net domestic product for different years as computed from the Model.

New Delhi
September, 1966

PITAMBAR PANT

[1]The computations were done on the Electronic Computer of the Programme Evaluation Organisation of the Planning Commission. Credit for the detailed work for preparing the 1964-65 Input-Output Tables belong to Shri M.R. Saluja of the Planning Unit of the Indian Statistical Unit. He was also responsible for the further work of extending the Table to 1970-71 and 1975-76 in collaboration with the Perspective Planning Division of the Planning Commission.

Table IR. 1 : Structure of Indian Economy 1964-65, 1970-71 and 1975-76 Output Levels

sector	unit	1964-65	1970-71	1970-71 Draft Outline	1975-76 case I	1975-76 case II
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. construction	index	100	181		273	307
2. electrical equipment	index	100	219		378	417
3. non-electrical equipment	index	100	177		371	417
4. transport equipment	index	100	169		276	299
5. metal products	index	100	158		254	266
6. finished steel	thou. tonnes	4432	8459	8800	16399	17721
7. non-ferrous metals	index	100	248		430	466
8. coal	mil. tonnes	64·4	106·6	106	153·5	160·4
9. iron ore	mil. tonnes	15·0	40·9	54[1]	86·5	85·7
10. cement	mil. tonnes	9·8	18·2	20	27·8	31·3
11. crude oil	mil. tonnes	2·1	9·8	9·5	12·8	13·4
12. petroleum products	mil. tonnes	8·5	21·2	20	32·5	33·4
13. fertilisers—nitrogenous	thou. tonnes	234	2038	2000	4000	4055
14. fertilisers—phosphatic	thou. tonnes	124	1081	1000	1989	2017
15. man-made fibres	index	100	198		370	372
16. paper and paperboard including newsprint	thou. tonnes	522	993	1053	1491	1523
17. cotton yarn	thou. tonnes	973	1220	1232	1705	1715
18. cotton textiles	mil. metres	7807	9909	10058	13638	13725
19. jute textiles	mil. tonnes	1·3	1·7	1·7	2·1	2·1
20. silk textiles	index	100	137		244	248
21. artificial silk fabrics	index	100	163		297	298
22. foodgrains	mil. tonnes	88·4	116·1	120	151·3	153·5
23. cotton	mil. bales	5·4	8·7	8·6	12·3	12·3
24. jute	mil. bales	6·0	9·0	10·2	11·5	11·6
25. oilseeds	mil. tonnes	8·6	10·7	10·7	16·0	16·2
26. sugarcane	mil. tonnes	122	157	135	229·3	231
27. tobacco	thou. tonnes	370	522	475	666	671
28. tea and coffee	index	100	134		202	198
29. sugar	mil. tonnes	3·2	4·8	4·5	6·7	6·8
30. gur and khandsari	index	100	116		171	172
31. vegetable oils	index	100	132		191	200
32. leather hides and skins	index	100	135		205	207
33. leather footwear	index	100	160		273	275
34. railways	index	100	155		232	239
35. motor transport	index	100	182		267	275
36. electricity generated	mil. kwhrs.	34407	78678	80000	134658	138405

Note : [1]See footnote to Table MB-4. Draft Outline figure is related to capacity production of steel and pig iron and a possible additional 3 million tonnes for export.

Table IR. 2 : National Income by Industrial Origin India : 1964-65, 1970-71 and 1975-76

(Rs. million at 1960-6 price)

sector	1964-65	1970-71	1975-76 case I	1975-76 case II
(1)	(2)	(3)	(4)	(5)
1. agriculture, animal husbandry	70423	88767	118188	119431
2. forestry	2094	3540	5449	5891
3. mining	1910	3531	5157	5368
4. industries	27657	47166	74922	79874
5. railways	3577	5469	8260	8537
6. motor transport	1950	3031	4440	4574
7. other commerce and transport	21906	28023	35848	37735
8. profession, liberal arts etc.	11200	14585	18993	19993
9. government services	15200	21675	31013	33399
10. house property	6100	7489	9194	9678
11. total	162017	223276	311464	324480
12. errors and omissions	6233	7724	11536	15520
13. total income adjusted	168250	231000	323000	340000
14. index of growth (row-11)	100	137·8	192·2	200·3

Appendix 1. Section Six

Estimates of Gross Domestic Expenditure and its Disposition 1960-61, 1970-71 and 1975-76

The attached table of estimates of Gross Domestic Expenditure and its disposition formed the basis of the control totals of final demand in the inter industry Table. The basis for projecting each item in the Table are briefly discussed below. The figures for 1965-66 and 1970-71 are derived directly from the Fourth Plan Draft Outline. Figures for 1975-76 have been worked out in Perspective Planning Division within the broad frame work of assumptions discussed in Chapter Two of the Draft Outline.

Item 1 : *National Income* : The figures of National Income are at 1960-61 prices, and have been taken from the Draft Outline of the Fourth Five Year Plan (p. 61).

Item 2 : *Net Domestic Product at Factor Cost* : The Net Domestic Product at factor cost is derived by adding to the national income the net factor payments to the rest of the world. These mainly include net payments on investment income. As foreign investments in India are larger than Indian investments abroad, this head shows a deficit. Also since India's net foreign debt has been and will continue to rise during the next decade this deficit will show a steady increase during the period.

Item 3 : *Indirect Taxes and Miscellaneous Receipts* (*net of subsidies*) : For 1960-61 and 1965-66 figures of indirect taxes have been taken from the budgets of the Centre and States. The figures for 1970-71 are based on the projections made by the Resources Working Group and as modified by the Planning Commission. These figures relate to the Central and State Governments. A rough estimate of the indirect taxes collected by local bodies has been added to them in order to obtain the total indirect taxation in the economy.

The estimates thus arrived at for 1965-66 and 1970-71 are at 1965-66 rates of taxation The comparable figures at 1960-61 rates of taxation, are derived by deducting the additional revenues in 1965-66 and 1970-71 as a result of indirect taxes levied during the Third Plan.

The estimates in respect of miscellaneous receipts and subsidies have been made mainly on the basis of past trend. Account has also been taken of the assumptions made regarding the subsidies to be given in the Fourth Plan both under plan as well as non-plan heads.

Estimates for 1975-76 are purely provisional but are derived in the same manner as above, making certain assumptions.

Item 5 : *Depreciation Provision* : The estimate of depreciation provision is derived from projection of net wealth in 1960-61, 1965-66 and 1970-71. The Reserve Bank of India has estimated the net tangible wealth at the end of 1960-61 (RBI bulletin, January, 1963). To this the net fixed investment anticipated during each plan period have been added. For arriving at the estimates of net investment at 1960-61 prices, the investment figures have been deflated by the index of cost of capital inputs as worked out in the Perspective Planning Division. The estimate covers publicly financed irrigation works, mining, organised industry, power, transport and urban housing. For the remaining sectors no attempt has been made to work out the depreciation as there is no dependable basis for doing so. It has simply been assumed that their depreciation provision will be equal to depreciation outlay required.

The depreciation provision has been worked out separately for construction and machinery. In respect of construction average life has been assumed to be 50 years. In respect of equipment and machinery different rates of depreciation have been applied depending upon the life of machinery and equipment in different sectors.

Item 7 : Excess of Import of Goods and Services over their Exports : Excess of imports of goods and services over their exports has been worked out by adding to the estimate of commodity imports, the non-factor payments and deducting from them the commodity exports and non-factor receipts on current account estimated for the fourth plan period. The estimate of commodity imports and exports in 1970-71 are taken from Table BP.1. Net of receipts and payments on account of factor incomes, the invisible account is estimated to show a net receipt of Rs. 40 crores during 1965-66. These latter receipts are estimated to increase to Rs. 70 crores in 1970-71.

Items 9 and 14 : Gross and Net Capital Formation : Gross capital formation is the sum of net fixed capital formation (item 14) and expenditure on replacement. The replacement outlay has been worked out by making a rough estimate of the life of construction and different types of machinery and equipment. The average life of construction as noted above has been taken at 50 years and that of machinery twenty years. For converting the estimates in terms of 1960-61 prices, the appropriate indices of cost have been applied.

The estimates of total net investment for 1965-66 is based on preliminary 'actual' of investment in the public sector and rough estimates for the private sector investment. This estimate has been deflated by the index of cost of investment inputs to convert it to 1960-61 prices. For 1970-71 the investment estimate has been worked out on the assumption that investment as proportion of national income would be 17·5 per cent as provided in the Draft Outline, in terms of current prices.

Item 10 : Public Consumption : The projections of non-plan expenditure of Centre and States prepared in the Planning Commission for the Fourth Plan have been taken as the starting point. To this has been added rough estimates of revenue outlay of local bodies met from their own resources and the revenue plan expenditure of Centre and States. From the total current expenditure thus arrived at, certain expenditures which do not constitute government consumption expenditure have been deducted. These include interest payments, appropriations and other transfers from revenue to capital, transfer payments and subsidies. For converting the consumption expenditure in terms of 1960-61 prices the increases due to revision in pay scales and increase in dearness allowances etc. have been deducted.

Table IR. 3 : Projection of Gross Domestic Expenditure and its Disposition
India : 1960-61, 1964-65, 1970-71 and 1975-76

(Rs. billion at 1960-61 prices)

item	1960-61	1964-65	1970-71	1975-76	
				case I	case II
(1)	(2)	(3)	(4)	(5)	(6)
1. national income	141·4	168·3	231·0	323·0	340·0
2. net domestic products at factor cost	141·9	169·3	233·1	362·0	343·0
3. add indirect taxes and misc. receipts (net subsidies)	11·9	14·0	23·5	35·0	36·0
4. net domestic products at market prices	153·8	183·3	256·6	361·0	379·0
5. *add* depreciation provision	6·1	8·0	13·5	21·0	23·0
6. gross domestic production at market prices	159·9	191·3	270·1	382·0	402·0
7. add excess of import of goods and services over their exports	4·1	5·2	2·5	(—)4·8	(—)2·4
8. gross domestic expenditure	164·0	196·5	272·6	377·2	399·6
9. gross capital formation	20·8	29·0	49·4	73·8	84·0
10. public consumption	11·6	20·0	31·8	45·5	49·0
11. private consumption	131·6	147·5	191·4	257·9	266·6
12. population (million)	439	484	560	630	630
13. per capita private consumption	300	305	342	409	429

Appendix 2. Section Six

Projections of Pattern of Final demand : 1964-65, 1970-71 and 1975-76

This note sets out the basis for which the commodity composition of expenditure on different categories of final demand have been estimated.

Private Consumption

Consumption pattern in base year

1. The projections of future consumer demand used in the Inter-industry model are based on the pattern of consumer expenditure in 1964-65.

2. The consumption pattern in the base year has been estimated largely by the commodity flow method [1]. The volume of a given commodity entering into final consumption is obtained from the following relationship :

Final Consumption = (Production + Imports) — (Intermediate uses + Capital formation + Exports + Increase in Stocks)

The value of consumption at market prices is obtained by multiplyjng the quantity consumed with the retail prices of 1960-61.

3. The accuracy of these estimates obviously depends a great deal on the quality and coverage of basic data on production, foreign trade and fluctuations in inventories. The available information in respect of these magnitudes is not entirely satisfactory.

4. For instance, there is no direct estimate of the consumer goods produced in the small scale and household sectors. For many important items like cloth, vegetable oils and gur, however, it is possible to obtain an indirect estimate of output from the quantum of raw materials absorbed in a particular year. For some other items, notably metal products, independent estimates of the unorganised sectors output have been made by organisations such as the Directorate of Small Scale Industries.

5. In the case of some products like milk and milk products and non-commercial fuels, where the available estimates of production are not reliable, the commodity flow method could not be used. Instead the estimates of base year consumption have been derived from National Sample Survey data. Estimates of expenditure on different services are mainly based on official national income estimates.

6. The data on inventory changes is particularly weak. There is some information on inventories held by Government and industrial establishments in the organisations. But practically nothing is known about commodity stocks held by farmers, small producers and traders.

7. The evaluation of consumption at retail prices also presents some problems. In the absence of any direct data on the average retail price of different commodities for the country as a whole, they have been estimated by applying trade and transport margins to their respective producers or wholesale prices.

8. Because of all these factors the estimates of base year consumption pattern are necessarily subject to qualification. Despite their shortcomings for most of the important items they appear to provide a reasonably reliable basis for estimating the order of increase in future demand.

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[1] For a detailed description of this approach and its limitations, see Kansal, S.M. Preliminary Estimates of Total Consumption Expenditure, 1950-51 to 1963-64 (ISI Discussion Paper No. 5, Mimeographed, September 1965).

Projections of Income Growth

9. The projection for 1970-71 relate to the targets of income, investment and consumption set out in the Draft Outline of the Fourth Plan. The calculations for 1975-76 relate to an aggregate income of Rs. 323 billion in 1975-76 rising from an estimated Rs. 231 billion in 1970-71. This implies a 7 per cent rate of growth during Fifth Plan. It is further postulated that the ratio of saving to national income will be raised to 21 per cent by 1975-76. On the basis of official estimates of population growth, per capita consumption works out to Rs. 342 in 1970-71 and Rs. 409 in 1975-76 (at 1960-61 prices). This implies an annual rate of increase in per capita consumption of about 1·9 per cent during the period 1964-65 to 1970-71, and 3·7 per cent during the five years ending 1975-76. Details of the calculation are shown in Table IR. 4.

Demand Elasticities

10. The likely increase in demand for major consumer goods consequent on the projected growth of aggregate consumption expenditure is estimated on the basis of their respective demand elasticities.

The relationship can be written as follows :

$$c_{it} = c_{io} \left\{ \frac{x_t}{x_o} \right\} q_i$$

$$C_{it} = P_t \; c_{it}$$

where c_{it} is the per capita consumption on commodity 'i' in year 't', x_t is the aggregate per capita consumption expenditure in year 't', q_i is the expenditure elasticity of demand for commodity 'i', P_t is population in year 't' and C_{it} is total consumption expenditure of i^{th} commodity in year 't'.

11. For purposes of the present study, we have used expenditure elasticities estimated on the basis of data from the 10th round of the National Sample Survey which relates to the period December 1955 to May 1956 [1]. Although several subsequent surveys of consumption expenditure were carried out by the NSS the data have been tabulated only by a few broad groups of commodities. The tabulations for the 10th round are the most detailed available. Also, the demand elasticities for broad groups computed from the 10th round data are in broad agreement with elasticities derived from both earlier and subsequent surveys. In view of this observed stability, it does not seem unreasonable to base projections on detailed elasticities obtained from the 10th round.

12. Table IR. 5 gives the elasticities as computed by N. S. Iyengar. The values have been separately estimated for rural and urban areas. The combined elasticity for the population as a whole is obtained as a weighted average, the weights being the total expenditure on each commodity in rural and urban areas respectively.

13. In most cases these weighted elasticities form the basis for projections. In some cases, notably cotton clothing and kerosene, somewhat different values have been used. The cross-section elasticity for cotton clothing appeared to be very high when compared to actual trends of consumption in relation to income growth during the past 10—15 years. In the case of kerosene, on the other hand, the actual trends point a much higher elasticity than obtained from cross-section data. For purposes of the present calculation, the elasticity of demand for cotton clothing is taken at 1·0 and for kerosene at 1·5.

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[1] Nikhlesh Bhattacharya, *A Survey of work done on demand projections at the Indian Statistical Institute, Calcutta* (ISI Working Paper No. 292, March 1964) N.S. Iyengar, *Some new estimates of Engel elasticities based on National Sample Survey data* (ISI Working Paper No. 299, December 1964).

14. The items for which estimates are based on demand elasticities cover about 75 per cent of the total expenditure. Details about the commodity composition of the remaining 25 per cent, a major part of it being the expenditure on services, are not fully available. It has therefore been taken to be the difference between aggregate personal consumption and the total expenditure on the specific items for which demand has been computed. The implied elasticity for this residual category works out approximately to unity.

The estimates of future demand

15. Table IR. 6 gives the expenditure elasticities used for purposes of projection as well as the estimated per capita expenditure on each item in 1970-71 and 1975-76. The corresponding estimates of total expenditure are set out in Table IR. 7 while Table IR. 8 presents the likely growth of consumer demand for selected items in quantitative terms.

16. The classification of commodities for purposes of demand projections is different from the sectoral classification used in the Input-Output matrix. Table IR. 9 gives the basis on which the demand projections have been fitted into the scheme of sectoral classification used in the Input-Output Table.

Government Consumption

Government consumption is the value of commodities and services purchased by Government Administration (excluding enterprises). The estimate for 1964-65 is taken from the official national income estimates. For the future it is obtained by deducting all transfers and subsidies from aggregate current expenditure of Government. There is no reliable information on the detailed commodity composition of government consumption expenditures. Some rough estimates of the pattern are available for 1960-61. In the absence of better data, this pattern has been used to distribute the projected aggregate government consumption expenditure among different commodities and services.

Capital Formation

Capital formation in 1970-71 and 1975-76 are specified exogenously. The assumption is that the ratio of net investment to national income will be of the order of 17·5 per cent by 1970-71 as indicated in the Draft Outline of the Fourth Plan. This is assumed to be further stepped up by 1975-76 to 18·2 per cent in alternative I (the "low income—low investment" case) and 20·3 per cent in alternative II ("high income—high investment" case). It is further assumed that the expenditure on replacement in a particular year will be approximately equal to net investment 15 years prior to that time.

The Model provides for five categories of capital goods : construction, electrical equipment, non-electrical equipment, transport equipment and metal products. The distribution of total investment between these categories in 1970-71 and 1975-76 is largely assumed to follow the pattern prevailing in 1964-65. The commodity composition of investment in the base year is derived from an analysis of the absorption of construction materials and the specified categories of equipment.

Exports

The level of aggregate exports as well as the commodity-wise details for 1970-71 correspond to the target set out in the Draft Outline of the Fourth Plan. The estimates for 1975-76 are based on tentative projections made by the Perspective Planning Division.

Imports

The Model treats imports as being specified exogenously. In other words it seeks to estimate the level of domestic production to be achieved to ensure balance between supply and demand subject to specified constraints on the level and composition of imports. The assumed level of imports of different products in 1970-71 correspond to the estimated import needs of the Fourth Plan. For 1975-76 the vector is based on preliminary estimates of the Perspective Planning Division.

Table IR. 4 : Projection of Gross Domestic Expenditure and its Disposition
India : 1960-61, 1964-65, 1970-71 and 1975-76

(Rs. th. million)

item	1960-61	1964-65	1970-71	1975-7
(1)	(2)	(3)	(4)	(5)
1. national income	141·4	168·3	231·0	323·0
2. net domestic products at factor cost	141·9	169·3	233·1	326·0
3. add indirect taxes and misc. receipts (net subsidies)	11·9	14·0	23·5	35·0
4. net domestic products at market prices	153·8	183·3	256·6	361·0
5. add depreciation provision	6·1	8·0	13·5	21·0
6. gross domestic production at market prices	159·9	191·3	270·1	382·0
7. add excess of commdodity imports over exports	4·1	5·2	2·5	(—)4·8
8. gross domestic expenditure	164·0	196·5	272·6	377·2
9. gross capital formation	20·8	29·0	49·4	73·8
10. public consumption	11·6	20·0	31·8	45·5
11. private consumption	131·6	147·5	191·4	257·9
12. population (million)	439	484	560	630
13. per capita private consumption	300	305	342	409

Table IR. 5 : Expenditure Elasticity of Selected Consumer Items based on the N.S.S. data
(15th Round, December 1955—May 1956)

item	rural	urban	combined
(1)	(2)	(3)	(4)
1. cereals	0·65	0·34	0·60
2. pulses	0·72	0·57	0·69
3. cereal substitute	0·22	(—)0·90	0·15
4. milk and milk products	1·74	1·30	1·62
5. vanaspati	3·05	1·22	2·94
6. vegetable oil	0·67	0·63	0·66
7. fruits and nuts	1·23	1·42	1·30
8. vegetables	0·82	0·91	0·84
9. meat, fish and eggs	0·82	0·91	0·85
10. sugar	1·72	1·07	1·46
11. gur and khandsari	1·10	0·66	0·92
12. salt	0·22	0·24	0·23
13. spices	(—)0·11	0·44	(—) 0·01
14. tea	1·18	1·06	1·15
15. coffee	1·39	1·59	1·49
16. tobacco products	0·78	0·77	0·78
17. cotton clothing	1·68	1·36	1·62
18. woollen clothing	2·28	1·56	2·08
19. art silk clothing	2·44	2·40	2·43
20. electricity	2·44	2·23	2·24
21. kerosene oil	0·63	0·61	0·63
22. other fuel and light	0·61	0·57	0·60
23. soap (toilets)	1·77	1·51	1·63
24. washing soap	1·66	1·00	1·44
25. medicines	2·03	1·56	1·90
26. footwear	1·94	1·60	2·36
27. domestic utensils	2·27	1·07	2·12
28. furniture	1·99	1·20	1·85
29. other durables	3·08	2·80	2·86

Note: The rural and urban figures are the adjusted expenditure elasticities q′ adjustment being for their additivity over items. The formula used for making the adjustment is as follows;

$$q' = q + 1 - \frac{\Sigma q^i c_i}{\Sigma c_i}$$

Where summation is for all items of consumption.

Table IR. 6 : Estimates of Per Capita Expenditure
India : 1970-71 and 1975-76

(rupees)

item	q	based on 1964-65		
		1964-65	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)
1. cereals	0·6	73·75	78·20	87·06
2. pulses	0·7	11·62	12·45	14·11
3. cereal substitute	0·2	1·66	1·69	1·75
4. milk and milk products	1·6	22·14	25·90	34·48
5. vanaspati	2·9	2·26	3·03	5·04
6. vegetable oils	0·7	6·51	6·97	7·90
7. oil seeds (incl. copra)	0·7	2·07	2·22	2·51
8. fruits	1·3	8·61	9·78	12·34
9. vegetables	0·8	6·46	6·99	8·06
10. meat, fish and eggs	0·8	8·95	9·68	11·17
11. sugar	1·5	5·71	6·61	8·65
12. gur and khandsari	0·9	6·89	7·53	8·84
13. salt	0·2	0·06	0·06	0·06
14. spices	0·7	5·69	6·09	6·91
15. tea	1·2	1·62	1·82	2·26
16. coffee	1·5	0·37	0·43	0·56
17. cigarettes	0·8	2·39	3·02	3·48
18. other tobacco products	0·8	7·65	8·04	9·27
19. cotton clothing	1·0	19·07	21·03	25·15
20. woollen clothing	2·0	1·24	1·51	2·16
21. art silk clothing	2·5	4·20	5·37	8·39
22. electricity	2·2	0·75	0·92	1·38
23. kerosene oil	1·5	2·56	2·96	3·88
24. motor spirit	2·5	0·77	0·98	1·54
25. soft coke	1·5	0·25	0·29	0·39
26. matches	1·0	0·66	0·73	0·87
27. other fuel and light	—	11·45	11·80	11·90
28. total fuel and light	0·7	16·44	17·68	19·96
29. soap	1·5	1·86	2·15	2·82
30. medicines	1·9	3·52	4·24	5·96
31. footwear	2·4	2·24	2·83	4·35
32. sewing machines	3·0	0·10	0·13	0·23
33. electric fans	3·0	0·27	0·36	0·62
34. radios	3·0	0·30	0·40	0·69
35. cars	3·0	0·47	0·63	1·08
36. scooters	3·0	0·15	0·20	0·34
37. bicycles	2·5	0·61	0·78	1·22
38. electric lamp etc..	2·5	0·22	0·28	0·44
39. domestic utensils	2·1	1·65	2·03	2·95
40. furniture	2·0	0·41	0·50	0·71
41. others	—	77·84	91·37	107·48
42. total	—	305·00	342·00	409·00

Table IR. 7 : Estimates of Total Consumption Expenditure India : 1970-71 and 1975-76

(Rs. million)

item	based on 1964-65		
	1964-65	1970-71	1975-76
(1)	(2)	(3)	(4)
1. cereals	35695	43792	54848
2. pulses	5624	6972	8889
3. cereal substitute	803	946	1102
4. milk and milk products	10716	14504	21722
5. vanaspati	1094	1697	3175
6. vegetable oil	3151	3903	4977
7. oil seeds (including copra)	1002	1243	1581
8. fruits	4167	5477	7774
9. vegetables	3127	3914	5078
10. meat, fish and eggs	4332	5421	5445
11. sugar	2764	3702	5569
12. gur and khandsari	3335	4217	38
13. salt	29	34	4353
14. spices	2754	3410	1424
15. tea	784	1019	353
16. coffee	179	241	2192
17. cigarettes	1350	1691	5840
18. tabacco products	3596	4502	15845
19. cotton clothing	9230	11777	15845
20. woollen clothing	600	846	1361
21. art silk clothing	2033	3007	5286
22. electricity	363	515	869
23. kerosene oil	1239	1658	2444
24. motor spirit	373	549	970
25. soft coke	121	162	246
26. matches	319	406	548
27. other fuel and light	5542	6608	7497
28. total fuel and light	7957	9901	12575
29. soap	900	1204	1777
30. medicines	1704	2374	3755
31. footwear	1084	1585	2740
32. sewing machines	48	73	145
33. electric fans	131	202	391
34. radios	145	224	435
35. cars	227	353	680
36. scooters	73	112	214
37. bicycles	295	437	769
38. electric lamp etc.	106	157	277
39. domestic utensils	799	1137	1859
40. furniture	198	280	447
41. others	37556	51164	67713
42. total	147588	191517	257666

Table IR. 8 : Estimated Quantities of Certain Selected Consumer Items
India : 1970-71 and 1975-76

item	unit	based on 1964-65		
		1964-65	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)
1. cereals	mil. tonnes	72·8	89·4	111·9
2. pulses	mil. tonnes	10·8	13·4	17·1
3. cereal substitute	thou. tonnes	2362	2782	3241
4. vanaspati	thou. tonnes	365	566	1058
5. vegetable oils	thou. tonnes	1400	1787	2405
6. sugar	thou. tonnes	2468	3305	4862
7. gur and khandsari	thou. tonnes	7580	9584	12657
8. salt	thou. tonnes	300	340	389
9. tea	thou. tonnes	157	204	285
10. coffee	thou. tonnes	32	44	64
11. cigarettes	billion. nos.	49·1	61·5	79·7
12. other tobacco products	thou. tonnes	240	300	389
13. cotton clothing	mil. metres	7100	9059	12188
14. art silk clothing	mil. metres	782	1183	2033
15. electricity	mil. kwh	2017	2861	4828
16. kerosene oil	mil. litres.	3022	4044	5961
17. soft coke	thou. tonnes	1512	2025	3075
18. matches	mil. nos.	5320	6817	9133
19. soap	thou. tonnes	400	535	790
20. footwear	mil. pairs	168	244	421
21. sewing machines	thou. nos.	267	406	806
22. electric fans	thou. nos.	820	1262	2444
23. radios	thou. nos.	518	800	1554
24. cars	nos.	16820	26148	50370
25. scooters	nos.	29200	44800	85600
26. bicycles	thou. nos.	1844	2731	4806
27. domestic utensils	thou. tonnes	79·9	113·7	185·9

Table IR. 9 : Estimates of Private Consumption Expenditure by Sectoral Classification of the Input-Output Matrix

India : 1970-71 and 1975-76

serial no. of input-output matrix	item	serial no. of demand projections	Rs. million 1964-65	1970-71	1975-76
(1)	(2)	(3)	(4)	(5)	(6)
1. 2.	electrical equipment	33, 34,38	382	583	1103
2. 3.	non-electrical	32	48	73	145
3. 4.	transport equipment	35, 36, 37	595	902	1663
4. 5.	metal products	39, 40	898	1277	2082
5. 14.	leather footwear	31	745	1090	1883
6. 15.	animal husbandry products	4, 10	15048	20199	29805
7. 17.	sugar	11	2764	[3702	5445
8. 18.	tea and coffee	15, 16	963	1260	1777
9. 19.	gur and khandsari	12	3335	[4217	5569
10. 20.	vegetable oils	6	3151	[4021	5412
11. 21.	vanaspati	5	1094	1697	3175
12. 22.	salt	13	29	34	38
13. 27.	cigarettes	17	1350	1719	2318
14. 28 and 29.	other tabacco products	18	3596	4586	6174
15. 32.	foodgrains	1, 2	41319	50764	63737
16. 35.	cotton textile	19	9230	11777	15845
17. 39.	woollen textile	20	600	846	1361
18. 43.	art silk fabrics	21	2033	3007	5286
19. 45.	oil seeds	7	1002	1277	1720
20. 48.	fruits, vegetables and spices	8, 9, 14	10048	12986	17836
21. 59.	petroleum products	23, 24	1612	2207	3414
22. 61.	rubber footwear	31	339	495	857
23. 69.	drugs and pharmaceuticals	30	1704	2520	4429
24. 70.	soap and glycerine	29	900	1204	1777
25. 74.	electricity	22	363	538	945
26. 75.	coal and coke	25	121	162	246
27. 76.	matches	26	319	409	548
28.	others	3, 27, 40,41	44000	57968	73080
29.	total		147588	191520	257670

Note: The figures in this table are at market prices of 1960-61 while those in the input-output table are at factor cost of 1960-61.

M/S153PC—1,500—23-11-66—GIPS

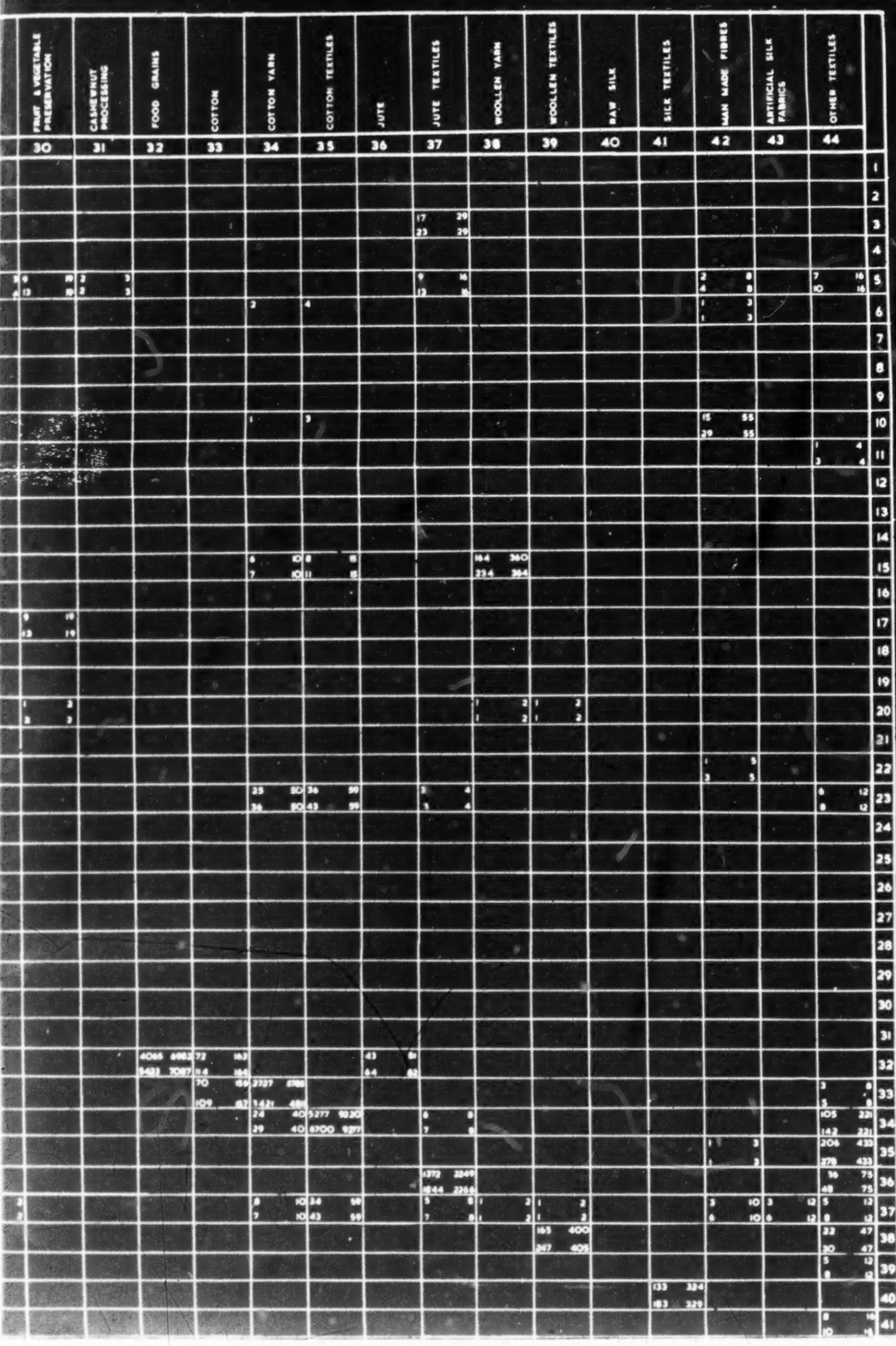
PRODUCING SECTORS / CONSUMING SECTORS		1	2	3	4	5	6	7	8	9
		CONSTRUCTION	ELECTRICAL EQUIPMENT	NON-ELECTRICAL EQUIPMENT	TRANSPORT EQUIPMENT	METAL PRODUCTS	IRON AND STEEL	IRON ORE	CEMENT	NON-FERROUS METALS
1	CONSTRUCTION		199	734	39	111	14	40		
2	ELECTRICAL EQUIPMENT		495	820	53	124	24	43		
3	NON-ELECTRICAL EQUIPMENT		10	411	208	773	19	53		
4	TRANSPORT EQUIPMENT		24	49	388	898	33	52		
5	METAL PRODUCTS	680	779	17	40	87	1083	1885	13	9
6	IRON AND STEEL	873	1998	33	6409	132	497	380	1427	687
7	IRON ORE	2338	6409	132	4971	380	1427	687	1729	1000
8	CEMENT	4343	7298	897	5470	21	1995	1098	830	1893
9	NON-FERROUS METALS	903	2444							
10	OTHER MINERALS	1933	2778							
11	RUBBER	984	2440	84	1476	86	200	79	294	432
12	LEATHER	294	4995	711	1926	1005	277	1078	381	888
13	OTHER LEATHER PRODUCTS		2		8					
14	LEATHER FOOTWEAR		5		9					
15	ANIMAL HUSBANDRY		12		441			4		
16	FLOUR MILLING		33		71					
17	SUGAR									
18	PLANTATIONS									
19	GUR AND KHANDSARI									
20	VEGETABLE OILS									
21	VANASPATI									
22	SALT									
23	STARCH									
24	MILK PRODUCTS									
25	BREWERIES, SOFTDRINKS									
26	BISCUITS, CONFECTIONERY									
27	CIGARETTES & CIGARS									
28	BIDI									
29	OTHER TOBACCO PRODUCTS									
30	FRUIT & VEGETABLE PRESERVATION									
31	CASHEWNUT - PROCESSING									
32	FOOD GRAINS									
33	COTTON				10	40				
34	COTTON YARN		9	29	16	45				
35	COTTON TEXTILES		14	37						
36	JUTE		8	33						
37	JUTE TEXTILES		10	36						
38	WOOLLEN YARN		2	8			3		125	356
39	WOOLLEN TEXTILES		5	6					233	401
40	RAW SILK									
41	SILK TEXTILES									

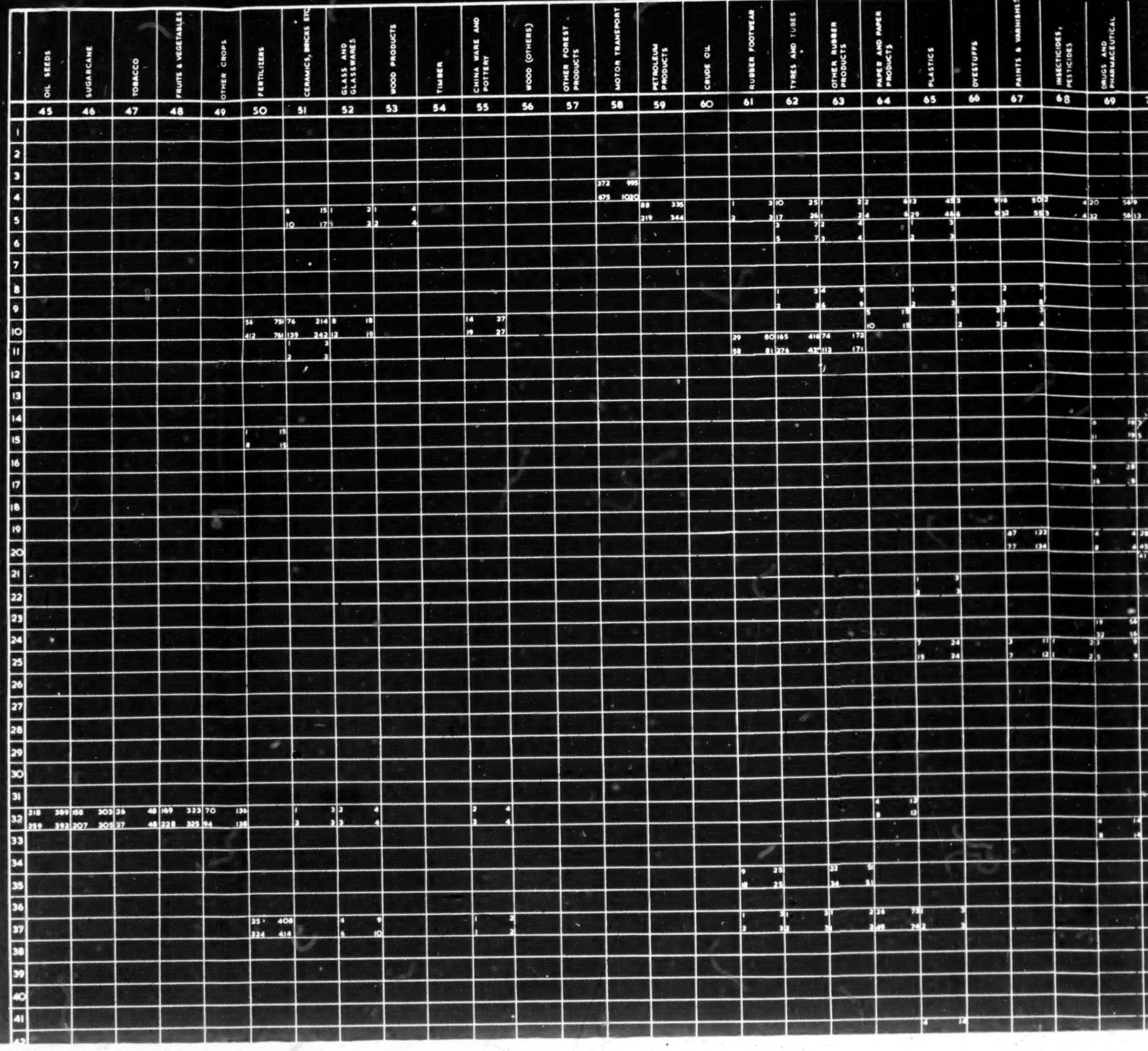
STRUCTURE OF INDIAN ECONOMY

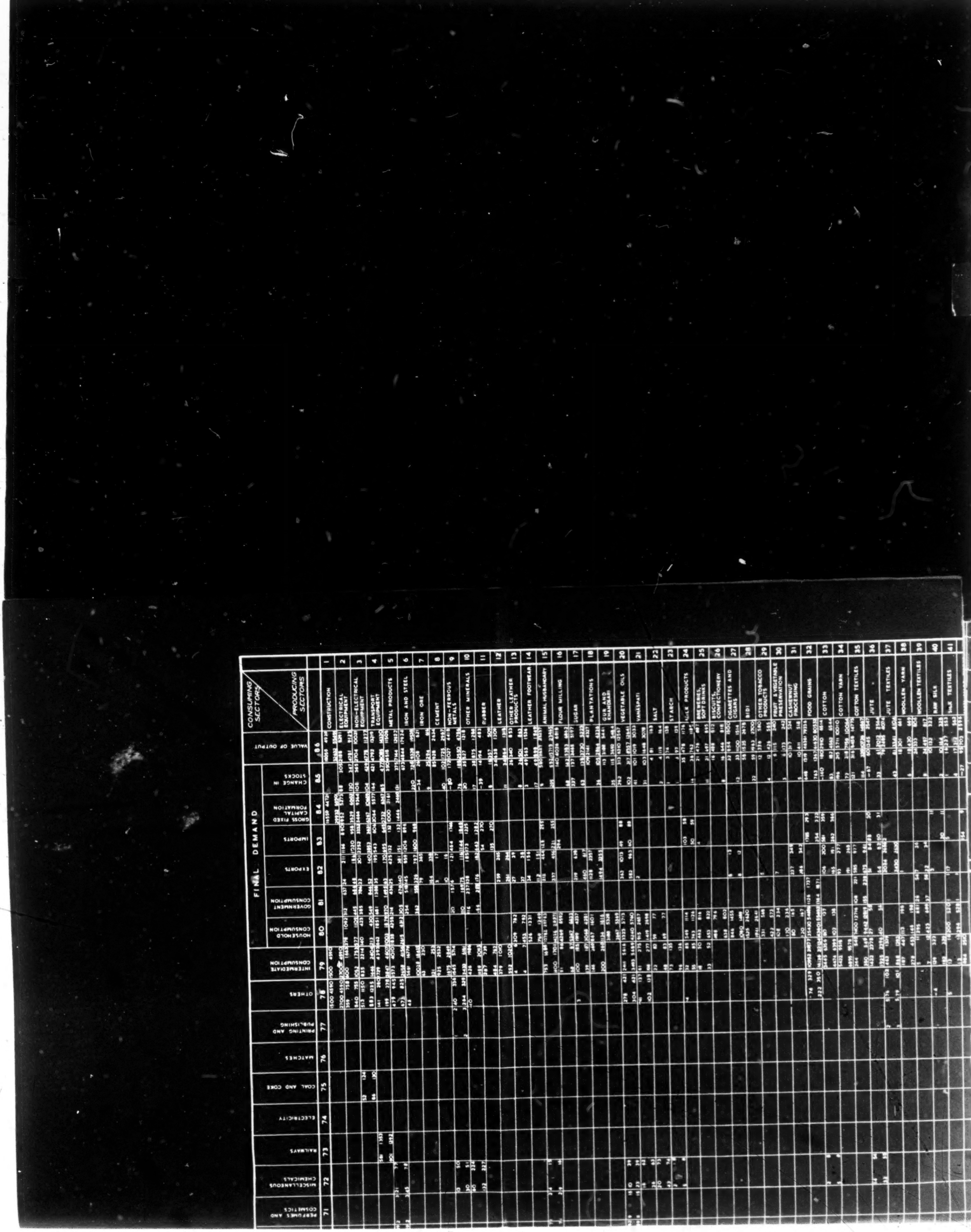
Inter-Industrial Flows and Pattern of Final Demand

1964-65, 1970-71 & 1975-76

(In Rs. Million at 1960-61 producer's prices)







		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
43	ARTIFICIAL SILK FABRICS																													
44	OTHER TEXTILES														2 6 4 6		3 5 4 5													
45	OIL SEEDS																				4901 9851 6385 9807									
46	SUGARCANE																1372 2895 2078 2909		3032 5741 3511 5215											
47	TOBACCO																									167 294 218 297	293 514 377 548	190 216		
48	FRUITS & VEGETABLES																							4 7 5 7	15 36 24 37	9 17 13 17				
49	OTHER CROPS															961 2091 1615 2112									1 2 2 2			152 268 196 270	3 4	
50	FERTILIZERS																		74 151 100 148											
51	CERAMICS, BRICKS etc	1100 3008 1991 3395	5 17 10 18																											
52	GLASS & GLASS WARES	35 99 65 118	13 50 29 55										4 9 6 9												3 8 3 5	27 51 40 53				
53	WOOD PRODUCTS	457 1233 814 1367	43 166 99 182	16 60 20 88	28	12 35 21 36							4 8 5 8						55 113 74 110						3 7 5 7	5 10 8 10	7 11 9 11	15 27 20 27		2 3
54	TIMBER	845 2318 1834 2628		51 190 91 216	42 119 73 129	1	1		1 3 2 3	1 4 3 5																				
55	CHINA WARE AND POTTERY																													
56	WOOD (OTHERS)			2 10 5 11		1											2	7 16 11 16	4 9 6 8		8 13 8 12				7 18 11 18	1 2 1 2			2 3 2 3	
57	OTHER FOREST PRODUCTS	277 740 489 833											29 59 39 59																	
58	MOTOR TRANSPORT																													
59	PETROLEUM PRODUCTS	57 148 99 166	2 8 5 9	8 34 14 31	16 40 24 48	25 99 43 72	15 53 28 59		5 13 9 15	3 13 8 14			8 15 9 19				8	3 5 4 5	11 22 14 21		6 13 8 13	1 3 2 3	1 2 1 2		1 2 2 2	1 2 1 2	1 2 1 2	1 3 1 2			
60	CRUDE OIL																													
61	RUBBER FOOTWEAR																													
62	TYRES AND TUBES				146 397 243 430																									
63	OTHER RUBBER PRODUCTS														4 11 6 11															
64	PAPER AND PAPER PRODUCTS		22 63 48 96	10 40 19 45		1				10 45 25 48					19 52 31 53		7 16 13 18	10 22 14 21						3 7 5 7		16 27 21 27	54 95 69 95	10 19 14 19	2 3	
65	PLASTICS		16 66 38 73	3 10 5 11																					4 9 6 10		10 17 14 17			
66	DYESTUFFS																													
67	PAINTS & VARNISHES	304 493 326 555	14 50 29 56	9 30 14 34	33 93 57 100	34 92 57 96	1																							
68	INSECTICIDES, PESTICIDES															158 349 236 352					5 15 8 15								
69	DRUGS AND PHARMACEUTICALS																													
70	SOAP & GLYCERINE																									30 58 44 56	2 3 3 3	3 5 4 6		1 1	
71	PERFUMES AND COSMETICS																													
72	MISCELLANEOUS CHEMICALS	30 116 67 128	20 70 33 79	44 119 73 128	41 104 64 108	9 36 18 39				9 40 23 43			6 17 11 17		10 28 16 28			8 16 11 16	18 35 23 34	31 84 37 85	32 63 42 63	6 18 10 18		1 2 1 2	1 2 2 2	2 33 2 48	81 62	2 3 3 3	3 5 3 5	1 1
73	RAILWAYS						547 2097 1091 2285	203 1171 554 1160	169 471 314 540	22 94 54 101	254 586 421 620		2 3 2 3	1 2 3 2	2 3 3 3		141 239 188 240	67 140 101 141	17 35 29 34	19 33 22 33	38 78 50 76	2 6 3 6	79 158 86 160				2 3 3 4	3 5 5 7	1
74	ELECTRICITY	13 58 33 64	23 80 38 90	46 132 81 143	53 138 86 144	153 622 324 678	2 12 9 12	62 119 117 202	19 180 92 172	15 38 24 38	1 2 1 3	4 9 5 9	2 5 3 5	3 6 4 6			22 34 27 36	50 104 75 104	1		6 28 17 28	5 15 8 15	2 4 3 4	3 4 3 4	4 9 4 10	4 7 6 7	4 6 5 8	1 2 2 3	1 2 2 3	
75	COAL AND COKE	2 8 5 9	9 30 14 34	9 26 16 29	27 69 43 72	246 852 444 930		66 187 122 211	6 22 13 24			1 3 2 3					7 14 11 16	8 10 7 10	3 4 3 4		13 25 17 25	2 6 3 6		1 2 1 2	1 2 2 4	3 5 5 3	2 3 3 3	1 2 1 2	1 3 2 3	
76	MATCHES																													
77	PRINTING AND PUBLISHING																													
78	TOTAL ROWS 1-77 (EXCEPT ROWS 58 & 73)	7025 19134 22662 29130	865 3594 2070 3958	875 3239 1540 3634	1731 4757 2190 5185	1643 4190 2600 4375	1722 5194 3227 6968	5 29 14 29	387 1102 721 1281	442 1984 1143 2143	35 79 56 83	155 277 310 281	369 758 499 783	99 248 146 251	319 871 510 879	5576 8129 8882 13295	3271 5530 4286 5565	1814 3186 2286 3201	184 373 245 363	3063 5238 3549 5270	978 1804 6723 10163	831 2483 3349 2919	6 12 8 12	45 84 58 84	304 743 487 752	158 296 229 296	225 374 300 377	373 489 354 488	462 815 397 821	181 232
79	OTHER MATERIALS	1000 2742 1802 3078	88 248 143 273	51 223 105 248	248 608 372 659	110 276 171 289	78 284 148 310	4 23 11 23	3 8 5 9	41 177 103 191	15 34 25 36		12 35 16 25	19 48 28 48										1 2 1 2	1 2 2 3	29 17 30		18 30 24 30	227 396 291 400		
80	CONSUMABLE STORES	410 889 806 1844	109 405 191 451	223 621 380 674	88 219 126 228	219 709 416 872		56 81 105 181	19 80 46 86				12 25 16 25		12 32 19 33		32 55 43 55	57 120 86 120	52 104 69 102		22 38 25 38	6 18 10 18	7 14 10 14	1 2 1 2	6 15 10 15	15 26 22 29	10 17 14 17	15 27 20 27	10 19 14 19	2 3
81	REPAIRS	12 41 24 46	30 111 53 126	48 732 81 143	41 104 64 108	156 569 296 620			10 44 26 48					1 3 2 3		77 163 110 164								2 4 3 4							
82	WORK DONE BY OTHERS	32 83 48 94	50 182 86 203	65 119 72 129	15 35 21 36	26 89 46 97		6 11 7 12	3 13 8 14				15 31 21 32		2 6 4 6		3 7 5 7	7 15 11 18	4 9 6 8				2 4 3 4		2 5 3 5	4 7 6 7	3 8 4 8	1 2 1 2	50 88 68 89	12 18
83	POSTAGE, STATIONERY	31 86 67 128	42 161 78 180	82 225 137 244	12 35 21 36	45 160 83 174		4 11 7 12	7 31 18 34				3 7 4 7		4 11 6 11		36 61 46 62	182 385 276 387	14 30 20 30				1 2 1 2		2 6 10 15	15 28 23 29	3 5 4 5	179 351 231 351	17 19 14 19	8 10
84	NON - INDUSTRIAL SERVICES	45 174 100 192	78 266 139 327	140 383 234 416	30 81 50 84	111 409 213 445		15 42 28 47	18 75 43 81				3 7 4 7		4 11 6 11		20 34 27 34	30 52 45 63	18 35 23 34				2 4 3 4		4 8 4 13	20 32 20 20	2 4 3 4	5 8 4 6	22 39 29 37	6 11 8 11	3 3
85	DEPRECIATION	59 224 139 246	114 426 201 476	265 777 445 788	36 92 57 98	359 1344 684 1439		63 179 117 202	25 107 61 115				5 10 7 11		4 11 6 11	172 372 252 375	19 34 27 34	74 156 112 157	34 69 46 68		32 63 42 63	7 21 12 22	4 8 6 8	3 4 3 4	6 20 13 20	14 26 20 26	8 15 10 13	11 2 10 11	3 2 3 3	
86	MARGIN	2380 9299 4053 10466	318 1269 723 1574	391 1215 573 1261	372 1560 954 1691	927 2259 1605 2665	846 3486 1803 3776	7 19 6 12	185 522 243 583	181 776 445 839	4 10 7 10	26 48 30 62	98 200 134 200	21 53 30 54	62 169 98 170		399 681 539 684	161 342 246 346	84 199 56 128	10 16 11 16	258 502 334 509	88 189 104 192	2 4 5 4	7 13 9 13	75 186 114 187	93 174 139 175	82 136 108 137	137 229 175 241	407 715 524 721	89 85
87	VALUE ADDED	8637 18148 12009 20423	708 2413 291 2655	984 3789 884 4283	1869 4087 2699 4431	1616 4117 2579 4305	1294 4843 2912 4843	97 587 263 552	214 598 392 634	281 1128 656 1295	473 1095 787 1159	15 158 117 184	121 248 183 248	200 501 295 507	156 425 249 428	3802 9572 6479 9668	246 410 328 419	440 930 268 934	271 357 236 350	115 197 133 198	820 1860 1236 1871	87 322 173 327	56 113 82 116	13 23 18 24	57 143 93 144	175 326 256 329	134 224 176 226	310 383 280	350 612 448 617	60 75
88	VALUE OF OUTPUT	16080 40381 32632 56691	1089 6291 678 9121	2704 10021 1728 11277	4795 13219 3085 14232	4518 11508 2744 12022	4844 17934 3325 19538	108 839 294 616	828 2634 1725 2967	1027 4419 2550 4786	527 1388 875 1285	190 483 257 509	638 1309 864 1218	340 853 501 863	563 1536 898 1549	16577 22222 13577 19445	4026 6898 5383 8862	2485 5197 3730 8223	2141 4329 2884 4236	388 544 3692 5484	6300 12587 8357 12861	1019 3033 1848 3078	81 183 119 184	74 138 97 139	478 1176 762 1180	476 887 897 895	488 862 648 818	854 1500 1100 1541	1525 2678 1963 2700	336 426

NOTES : This input Output Table (of static type) is a composite of 4 Input Output Tables pertaining separately to 1964-65, 1970-71 (Fourth Plan) and 1975-76 (in two alternative formulations). Each cell has thus 4 figs. corresponding to the entries of the related sub table in the manner shown [a c / b d], where a is for 1964-65, b for 1970-71 c for 1975-76 (alternative I: low income, low investment) and d for 1975-76 (alternative II: high income, high investment.)

TOTAL VALUE ADDED (R87/C86): adjusted by adding to value added for 77 sectors (R87/C79), contribution of services etc excluded from the model, [54406 95048 / 71773 100905] and discrepancies [6233 11536 / 7734 15520]

PPD/151 : 16.9.66

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